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Abstracts 1720-2033

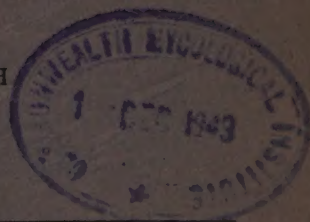
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THE VETERINARY BULLETIN

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[No. 8.]

DISEASES CAUSED BY BACTERIA AND FUNGI

SMITH, H. W. (1947.) The examination of staphylococci of animal origin with particular regard to the determination of criteria of pathogenicity.—*J. Comp. Path.* 57. 98-115. 1720

In order to discover criteria of pathogenicity for staphylococci from animal sources 178 strains comprising 110 known pathogens and 68 strains believed to be non-pathogenic were examined in detail. The only single test differentiating pathogenic from non-pathogenic strains was the coagulase test carried out either by the tube, the rapid slide or the plate method. Only some of the pathogenic strains and none of the non-pathogens exhibited semi-clear haemolysis on blood agar, liquefaction of solid serum, production of fibrinolysin and haemolytic, dermal necrotic and lethal toxins and the lethal effect when inoculated intraperitoneally into mice. There was variable response by both pathogenic and non-pathogenic staphylococci to the liquefaction of gelatin, action on litmus milk, fermentation of various substances and production of pigment. The non-pathogenic strains tended to grow more rapidly than the pathogens at 17°C. It was noted that the pathogenic strains from dogs and poultry were distinguishable by cultural characters and toxin formation from the remainder of the pathogens from horses, cattle, sheep and goats.—K. G. TOWERS.

SMITH, H. W. (1948.) Investigations on the typing of staphylococci by means of bacteriophage. I. The origin and nature of lysogenic strains. II. The significance of lysogenic strains in staphylococcal type designation.—*J. Hyg., Camb.* 46. 74-81; & 82-89. 1721

I & II. Sixteen strains of phage type 42D were divided into nine types by additional phages, made possible by the acquired phage resistance of some strains. All these resistant variants were lysogenic and some were resistant to more than one phage.

While the phage method, therefore, is important in typing staphylococcal strains, a

complicating factor is that strains identical except for the acquired phage resistance might be classified as different types. As this change of type may take place in the field the method may not be practicable for long epidemiological investigations. S. therefore attempted to classify strains into so-called genetic types but found that there were many difficulties.—J. I. TAYLOR.

ANON. (1948.) The Koch glyoxylide treatment.—*J. Amer. vet. med. Ass.* 113. 220-223. 1722

In 1938 W. F. Koch, of Detroit, announced that a preparation termed glyoxylide, described as an unsaturated substance having the structural formula of $O = C = C = O$ would destroy the "cancer germ" without injury to the host and was also effective in the treatment of TB., psoriasis, leprosy, poliomyelitis and syphilis. He devised a theory that the supply of essential carbon compounds, lowered in conditions of disease, can often be renewed by injection of minute quantities of certain reagents. For glyoxylide a 5 ml. injection of 1:1 trillion dilution [$1:10^{18}$] was recommended and benzoquinone was used at a dilution of one part in one million parts of water.

Reports of trials against mastitis were inconsistent.—E. M. J.

SCHALM, O. W. (1948.) The effect of subcutaneous injections of benzoquinone (Koch treatment) on *Staphylococcus aureus* infection of the bovine mammary gland.—*J. Amer. vet. med. Ass.* 113. 561-563. 1723

Cows secreting toxicogenic and coagulase positive staphylococci were inoculated subcutaneously as follows:—two cows with one dose; four cows with two doses at a 24-hour interval; and four cows with three doses at 24-hour intervals of 10 ml. of one part benzoquinone in one million parts distilled water. The treatment did not remove the staphylococci. [The Koch treatment claims, however, the removal of the organisms, but the rendering innocuous of the toxins elaborated by the organisms.]—M. S. B.

GALLAHER, M. A. (1948.) Some aspects of

bovine streptococcal mastitis.—*Irish Vet. J.* 2. 126–140. 1724

A review of the predisposing factors, methods of infection, economic importance and public health aspects of *Str. agalactiae* infection is given. This is a general discussion on the subject.

—J. I. TAYLOR.

CHURCHWARD, R. E. (1948.) A note on the occurrence of electric shocks from milking machines and their possible effect on development of mastitis.—*Aust. vet. J.* 24. 150–151. 1725

Persons handling electric milking machines often experience small shocks. It is suggested that cows also receive such shocks. Mastitis incidence figures are quoted from four farms installing electric milking machines, in which the mastitis incidence rose abruptly, and from one farm where an oil engine operated machine was installed, in which the mastitis incidence remained at the previous level. In two of the former cases, replacement of the electric motor with an oil engine reduced the incidence of mastitis, as did a return to hand milking in one other case. Complete records were kept at only one of these farms.

—J. H. WHITTEM.

DELLA GRAZIA, M. (1947.) Ricerche su alcuni stipiti avirulenti e attenuati del *B. anthracis*. [Some avirulent and attenuated strains of *B. anthracis*.]—*G. Batt. Immun.* 36. 409–416. [English, French and German summaries.] 1726

G. studied seven strains of *B. anthracis*, four of which were avirulent for the g. pig and mouse and three avirulent for the g. pig, but not for the mouse. None of the strains examined was capable of conferring immunity on g. pigs inoculated with virulent anthrax bacilli. There appeared to be no relationship between the virulence of the strains and their morphological, cultural and biological characters, except that the average diameter on agar of colonies of low virulence was greater than the average diameter of colonies of a fully virulent strain.—I. W. JENNINGS.

GLADSTONE, G. P. (1948.) Immunity to anthrax. Production of the cell-free protective antigen in cellophane sacs.—*Brit. J. exp. Path.* 29. 379–389. 1727

The author describes a new method of producing soluble protective antigen by *B. anthracis* in serum cultures, with a yield 25 times greater than by the previous method. The culture is grown in a cellophane sac continuously perfused with aerated sterile broth and supplied with oxygen through a second cellophane sac within the culture. Growth and antigen yield were maximal in three days. Passive immunization resulted in rabbits when serum from animals

hyperimmunized with this antigen was used. Thus, living organisms are not needed to produce effective sera.—W. R. BETT.

HOUSEWRIGHT, R. D., BERKMAN, S., & HENRY, R. J. (1947.) The relative effectiveness of pure penicillins against *Bacillus anthracis* in vitro and in vivo.—*J. Immunol.* 57. 343–349. 1728

Commercial samples of penicillins, F, G, K, and X, were tested for activity against anthrax, their relative activities being found to be 52, 100, 29, and 160 *in vitro*, and 80, 100, 40, and 107 *in vivo*, using mice. Temperature appeared to have some influence on the results.

—M. R. ORMEROD.

I. FEINSTONE, W. H. (1946.) Chemotherapy of tuberculosis. I. A new class of tuberculostatic substances.—*Proc. Soc. exp. Biol. N.Y.* 63. 153–155. 1729

II. DUCA, C. J., WILLIAMS, R. D., & SCUDI, J. V. (1948.) Chemotherapy of tuberculosis. III. In vitro and in vivo activities of various compounds.—*Ibid.* 67. 159–162. [For part II, see *V.B.* 19. 190.] 1730

I. Several hundred derivatives of 5-amino-2-butoxypyridine have been synthesized, one of which, the sodium formaldehyde bisulphite derivative, relatively among the least toxic, is included in the comparison *in vitro* of the bactericidal effects of 5-amino-2-butoxypyridine, certain sulphonamides and sulphones. The new compounds in dilutions in excess of 1:3 million inhibit the growth of strain 607—the rapidly growing strain of the tubercle bacillus. Dilutions as high as 1:100 million inhibit virulent strains. Only *Mycobacterium* is susceptible to these substances in significant dilution. The antimycobacterial activity of 5-amino-2-butoxypyridine and its derivative is primarily bacteriostatic rather than bactericidal.

II. 5-amino-2-butoxy-pyridine sodium formaldehyde bisulphite was highly active when tested *in vitro* against non-virulent *Mycobact. tuberculosis* strains H87RV and B1 growing in Proskauer-Beck medium. Tested against virulent tubercle bacilli growing in Dubos' medium activity was greatly lessened. The drug was ineffective in the treatment of experimental TB. in mice and g. pigs.—W. R. BETT.

ROSE, H. M., GELLHORN, A., & CULBERTSON, J. T. (1946.) Antimony compounds in tuberculosis. Their effect on experimental tuberculosis in guinea pigs.—*Amer. Rev. Tuberc.* 54. 299–304. [English & Spanish summaries. Abst. from English summary.] 1731

It had been suggested that the administration of antimony compounds for the treatment of other

conditions was liable to have an adverse influence on coexistent TB.

Tuberculous g. pigs were treated intensively with the antimony compounds anthiomaline, fuadin, neostam and neostibosan. The drugs thus administered did not have any adverse effect on the course of the tuberculous infection in these animals.

YOUMANS, G. P. (1944.) An improved method for testing of bacteriostatic agents using virulent human type tubercle bacilli.—*Proc. Soc. exp. Biol.*, N.Y. 57. 119–122. 1732

The effect of bacteriostatic agents incorporated in a fluid synthetic medium was tested upon virulent tubercle bacilli. Measured volumes of standardized suspensions of organisms served as inoculum. The test tubes were shaken after 7 and 14 days of incubation. The readings took place after 7, 14 and 21 days, and the subsurface growth as well as the pellicle growth were taken into account. For control purposes a non-virulent acid-fast organism was used. The method employed allows a more rapid and efficient testing of antibacterial substances against human tubercle bacilli than was previously possible. It was further shown that no strict correlation exists between the inhibitory actions of chemotherapeutic compounds upon virulent and avirulent acid-fast organisms.—E. K.-N.

EISEMAN, B. (1948.) A means of increasing the tuberculostatic effect of known chemotherapeutic agents.—*J. exp. Med.* 88. 189–203. [Author's summary and conclusions copied *verbatim*.] 1733

By incorporating a known tuberculostatic agent on one end of a surface-active molecule, an increased *in vitro* effect on the tubercle bacillus has been obtained.

This activity is presumably due to the concentration of the drug molecules at or beneath the mycobacterial cell boundary.

Whether the surface-active drug actually penetrates the lipid, or lipo-protein complex that is so characteristic of the mycobacteria is only problematic. According to comparable purely physical-chemical experiments, such a penetration is quite likely.

Increase in tuberculostatic effect of over 1000-fold has been attained by rendering surface-active the drugs included in this study. The quantitative evaluation of this increase in activity has been obtained by measuring drug action both when its surface-active properties are functional, and when these properties have been selectively abolished by a specific surface-active antagonist.

It is believed that the molecular orientation of a surface-active drug about a bacterial cell

accounts for one component of its antibacterial action. Certain previously described surface-active antituberculous drugs and antibiotics have been examined in light of this interpretation.

It may be anticipated that the more potent tuberculostatic drugs such as streptomycin could be made more effective by incorporating the molecule into a surface-active compound, according to the principles herein described.

SATTLER, T. H., & YOUMANS, G. P. (1948.) The effect of "tween 80," bovine albumin, glycerol, and glucose on the growth of *Mycobacterium tuberculosis* var *hominis* (H37Rv).—*J. Bact.* 56. 235–243. [Authors' conclusions copied *verbatim*.] 1734

Unpurified "tween 80" (0.05 per cent) markedly inhibited the growth rate of virulent tubercle bacilli (H37Rv) in modified Proskauer and Beck synthetic media.

Purified tween 80 (0.05 per cent) exerted a similar bacteriostatic effect but to a lesser degree.

The same inhibitory effect of this surface-active agent was noted using Dubos basal medium.

Glucose and glycerol markedly stimulated the rate of growth.

Although purified tween 80 inhibited growth in the presence of glucose and glycerol, it stimulated growth slightly in the absence of these agents.

Bovine serum albumin (fraction V; 0.2 per cent) did not stimulate growth of the tubercle bacillus.

Bovine serum albumin (0.2 per cent) protected tubercle bacilli against the inhibitory effect of purified and unpurified tween 80 (0.05 per cent) but only during the first 5 days of growth.

The modified P and B synthetic medium containing 2.0 per cent glycerol supported growth of tubercle bacilli at a maximum rate for a longer period than the Dubos medium containing 0.2 per cent glucose.

FITZGERALD, R. J., & BERNHEIM, F. (1948.) The effect of salicylic acid on the growth, morphology and virulence of *M. tuberculosis*.—*Amer. Rev. Tuberc.* 58. 210–214. [English and Spanish summaries. English summary copied *verbatim*.] 1735

Organisms of the H37RV strain of *Mycobacterium tuberculosis*, adapted to grow in high concentrations of salicylic acid, show an increased size, an apparent increase in virulence, and metabolic reactions which differ from the normal.

MIDDLEBROOK, G., & DUBOS, R. J. (1948.) Specific serum agglutination of erythrocytes sensitized with extracts of tubercle bacilli.—*J. exp. Med.* 88. 521–528. [Authors' summary copied *verbatim*.] 1736

A hemagglutination reaction has been de-

scribed between sheep erythrocytes treated with a component of a polysaccharide fraction of mammalian tubercle bacilli and the sera of experimental animals or of tuberculous patients. Evidence has been presented for the specificity of this reaction. A modification of the test, involving an inhibition reaction, has been developed for the detection and quantitation of minute amounts of the material responsible for the hemagglutination reaction.

VAN DEINSE, F. (1948.) **The preservation of the BCG strain.**—*Amer. Rev. Tuberc.* 58. 571-575. [Spanish summary. English summary copied verbatim.] 1737

The most suitable culture medium for the preservation of BCG is Sauton-potato. Sauton liquid synthetic medium is excellent for a few passages to obtain a rich harvest of bacilli for vaccine preparation, but impairs the vitality of the strain in the long run and is therefore improper for the preservation of BCG. Ox-bile potato, which, after a long series of passages, extinguishes the virulence of bovine tubercle bacilli, is suitable, however, for maintaining their vitality in good form. Therefore, the observations of Jensen and Holm that BCG after many passages on Sauton loses its slight virulence on this medium, but may be restored to its former virulence by a few passages on bile potato, may be explained by the concept that the "vitality" rather than the "virulence" of the strain was affected.

Row, R. (1946.) **Isolation of *Mycobacterium leprae* in culture.**—*Indian Physician.* 5. 75-81. 1738

R. states that he cultured *Mycobact. leprae* from a cutaneous leproma in symbiosis with *Leishmania donovani* in haemoglobinized saline at 20°C. There was an active proliferation of the acid-fast bacilli in close contact and inside the *Leishmania* rosettes in seven days, increasing in 14 days. The culture transferred to haemoglobinized saline agar and incubated at 20°C. presented in 10-15 days a translucent film on the surface consisting mainly of *Leishmania* interspersed with fine yellow colonies of acid-fast bacilli. The yellow colonies transplanted to glycerin agar and glycerin potato at 37°C. yielded pure cultures of coccal and coccobacillary intermediaries of acid-fast bacilli, the *Leishmania* being eliminated at the higher temperature.

M. stefanski was also grown under similar conditions.—V. R. RAJAGOPALAN.

NOTTBOHM, H. (1947.) **Unspezifische Reaktionen bei der serologischen Feststellung des Maleus.** [Non-specific reactions in serological diagnosis of glanders.]—*Dtsch. tierärztl. Wschr.* 54. 178-175. 1739

False positive reactions to the complement fixation test for glanders were observed, but only rarely—to the extent of 0.07% among 138,000 horses tested. They are explained as a partial reaction by part of the antigen with bacteria other than the glanders bacillus.

Such cases give a negative eye test and commonly revert to negative to the complement test after a time.—J. E.

JASTRZEBSKI, T. (1945.) **Szczepionka przeciw różycy świń wg Muromcewa.** [Muromtsev's swine erysipelas vaccine.]—*Med. Wet.* 1. 114-117. 1740

J. discussed briefly knowledge about the immunization of pigs against *Erysipelothrix rhusiopathiae*. He described the preparation of a formal-killed suspension of culture grown on agar medium, stating that such a vaccine retains its qualities for ten months, the immunity conferred lasting for about five months. He used two inoculations. A small ("booster") dose given later, in addition, served to raise the immunity.

KAPLAN, M. M. (1948.) **Production and use of new biological products against swine erysipelas in Poland.**—*Vet. Med.* 43. 174-179. 1741

A general account of immunization of pigs against swine erysipelas with emphasis on the importance of this disease in Central Europe. The author refers to the danger that the use of live vaccine plus serum, the commonly used method, may leave new infection behind.

The author gave details of the use of the attenuated culture vaccine prepared by Staub which had a useful life of about a month. A single subcutaneous inoculation of 0.5 ml. was used irrespective of the age or live-weight of the subject. An immunity of 8-12 months' duration was produced, but it was advised that the vaccine should not be used during the hot months of the summer. In 1947 the Polish veterinary services inoculated 19,990 pigs with Staub's vaccine, 2.64% (528) of which subsequently developed erysipelas; most of these cases occurred during the first 14 days following vaccination. Controls were not kept, but the incidence of the disease was much lower than in previous years.

The vaccine used by Muromcev is also discussed (see preceding abst.). Of 17,410 pigs inoculated with Muromcev's vaccine during the height of the swine erysipelas season, 0.33% (58) developed the disease on or after the 14th day following vaccination. Controls were not available.

To minimize the losses from endocarditis and arthritis in horses used for the production of swine erysipelas serum, agglutinated *Erysipelothrix rhusiopathiae* organisms inoculated subcutaneously constituted a satisfactory antigen in place of an intravenous injection of whole culture.—C. B.

EDWARDS, C. M. (1949.) **Polyarthritis in lambs following serum inoculation.**—*Vet. Rec.* 61. 95-97. 1742

Erysipelothrix rhusiopathiae was isolated from lambs affected with polyarthritis following inoculation with commercial lamb dysentery and pulpy kidney sera, it being believed that the organism was present in the serum. The symptoms, pathology and bacteriology of the cases are described.—J. SCARNELL.

EVELETH, D. F., GOLDSBY, A. I., & NELSON, C. I. (1949.) **Fowl cholera (*Pasteurella multocida*).**—*Vet. Med.* 44. 73-78. 1743

Records some observations on fowl cholera made over a four-year period. Cultures which had become non-pathogenic on sub-culture became pathogenic once again when inoculated into 10-12-day-old chick embryos. The importance of debilitating factors, such as severe climatic conditions, change in foods, etc., as pre-disposing causes in outbreaks of fowl cholera is stressed. Prophylactic immunization appeared to have little value in preventing the disease. In acute outbreaks hyper-immune serum had a definite value. In outbreaks of the disease the value of sulphakinoxaline was confirmed.—D. LUKE.

MOHAN, R. N., & BHADURY, S. K. (1947.) **Some observations on pasteurellosis. I. An outbreak of pasteurellosis in geese.**—*Indian J. Vet. Sci.* 17. 247-248. 1744

MOHTEDA, S. N. (1947.) **Some observations on pasteurellosis. II. Pasteurellosis in ducklings.**—*Ibid.* 249. 1745

BHADURY, S. K. (1947.) **Some observations on pasteurellosis. III. Pasteurellosis in ducks.**—*Ibid.* 251-252. 1746

I. On a farm in Bengal with a stock of 1,325 geese and a few ducks the authors record an outbreak of fowl cholera involving 160 geese.

II. M. records an outbreak of fowl cholera in ducks in Hyderabad state. This strain of *Past. aviseptica* was antigenically different from the usual fowl strain.

III. B. records an outbreak of fowl cholera on a duck farm in Bengal.—K. C. SINHA.

LAZARUS, A. S., & NOZAWA, M. M. (1948.) **The endotoxin of *Pasteurella pseudotuberculosis*.**—*J. Bact.* 56. 187-190. [Authors' summary copied verbatim.] 1747

An endotoxin was prepared by lysis of two different strains of *Pasteurella pseudotuberculosis* with bacteriophage. The endotoxin produced major circulatory changes and death in less than 12 hours in rabbits, guinea pigs, and white mice. In addition to death of experimental animals, the endotoxin in small doses was able to produce necrosis in the skin of guinea pigs.

The endotoxin was inactivated by heating for 30 minutes at 60 C, being slightly more sensitive in this respect than the endotoxin of *Pasteurella pestis*.

Endotoxin, after detoxification with formalin, was ineffective in producing antitoxin, no evidence of protection being obtained.

GRATCH, I., PURLIA, P. L., & MARTIN, M. L. (1949.) **Effect of sodium fluoroacetate (1080) in poisoned rats on plague diagnosis procedures. Preliminary report.**—*Publ. Hlth Rep., Wash.* 64. 339-342. [Summary and conclusions copied verbatim.] 1748

Experiments showed that sodium fluoroacetate (1080) in rats killed by this poison does not reach the liver and spleen in a sufficient amount to contraindicate routine injections from the rats into guinea pigs for biological confirmation of a tentative diagnosis of plague.

Sodium fluoroacetate, in a concentration used for rat poisoning, has no bacteriostatic properties against *Pasteurella pestis*.

CHRISTIE, R. (1948.) **Observations on the biochemical and serological characteristics of *Pseudomonas pyocyanea*.**—*Aust. J. Exp. Biol. Med. Sci.* 26. 425-437. 1749

C. examined 138 strains and divided them into a pathogenic and a saprophytic group. All strains from pathological sources and a few other strains grew well at 37°C. and produced *beta* or *alpha* prime haemolysis on sheep blood agar plates. No regular correlation between results of biochemical tests and source could be established. By slide agglutination on the basis of somatic antigen seven serological groups were demonstrated in the pathogenic and six in the saprophytic group. Strains may differ further in their flagellar antigens.

C. proposes that the name *Ps. pyocyanea* be applied to the pathogenic and *Ps. aeruginosa* to the saprophytic members.—R. V. S. BAIN.

ØRSKOV, S. L. (1948.) **Experiments on active and passive permeability of *Bacillus coli communis*.**—*Acta path. microbiol. scand.* 25. 277-283. [In English. Abst. from author's summary.] 1750

By direct microscopic examination and by a photoelectric method it was found that substances such as alcohol, glycerol, hexamethylenetetramine and antipyrine when added in hypertonic solutions permeated *Bact. coli* cells so quickly that no plasmolysis occurred. With urea the reaction was slower and the plasmolysis disappeared after 1-2 min. and with malonamide the plasmolysis which occurs disappeared after 6-8 min., these times being fairly constant.

In hypertonic solutions of glucose, fructose

and mannitol plasmolysis disappeared very slowly, when the bacilli were thoroughly washed with 0.9% NaCl.

If potassium as potassium chloride was present in the suspension or in broth culture plasmolysis disappeared after a few min.

It was found by Pulver and Verzar (1940) for yeast and by Leibowitz and Kupermintz (1942) for coli bacilli that the addition of glucose gave rise to a considerable potassium absorption. When a suspension of coli bacilli in broth was mixed with a hypertonic sodium chloride solution plasmolysis disappeared after a few min. Even in a 5-6% NaCl solution many cells appeared normal when glucose was added to the solution.

The disappearance of plasmolysis to a great extent was caused by potassium absorption. If the osmotic pressure of the broth was doubled by adding NaCl, the potassium content of the cells, determined by ashing the bacteria, was increased 31-68%. The potassium absorption was an active process as the potassium concentration of the cells was much higher than the concentration of the fluid outside the cells. The potassium absorption in hypertonic sodium chloride solutions was considerably hindered by sodium azide, hydrocyanic acid and moniodo-acetic acid. Sodium fluoride and urethane had little effect.

If coli bacilli were thoroughly washed in a solution containing 0.65% NaCl and 0.19% KCl, the addition of hypertonic NaCl solution caused no potassium absorption, probably because no weak acids were present to follow potassium into the cells; chlorine ions permeate the protoplasm only with difficulty.

The appropriateness of the established osmotic regulation and its relation to potassium absorption in glucose solutions is discussed.

MACKERRAS, I. M., & MACKERRAS, M. J. (1949.)

The bacteriological diagnosis of salmonella infections.—*Med. J. Aust.* 1. 1-3. 1751

During an investigation of salmonella infections in Brisbane, 223 strains of salmonella belonging to 13 species were isolated from the faeces of infants. The authors discuss the selection of materials, the bacteriological procedures used and their reliability.—N. WICKHAM.

CLARENBURG, A., & VINK, H. H. (1948.)

Salmonella anatum-infectie bij het rund in verband met bacillendragers bij eenden. [*Salmonella anatum* infection in cattle in connexion with carriers among ducks.].—*Tijdschr. Diergeneesk.* 73. 540-542. [Abst. from English summary.] 1752

S. anatum was cultivated from the liver and the gall-bladder of a cow slaughtered in emergency. An infection with the same salmonella type was

found among the ducks on the same farm. It was considered obvious that the infection of the cow was caused by the contaminated faeces of the ducks.

So far as the authors are aware *S. anatum* has not previously been described from cattle.

CLARENBURG, A., VINK, H. H., & HUISMAN, W.

(1949.) Salmonella bacterien in de mesenteriale lymphklieren van gezonde varkens. [*Salmonella* organisms in the mesenteric lymph nodes of healthy pigs.].—*Tijdschr. Diergeneesk.* 74. 127-128. [Abst. from English summary.] 1753

The following *Salmonella* organisms were found in the mesenteric lymph nodes of 14 out of 503 healthy pigs:—*S. typhi-murium*, *S. dublin*, *S. enteritidis*, *S. newport* and *S. give*. Examination of faeces was negative.—E. G.

HOFFMAN, H. A., JONES, E. E., & HARR, J. F.

(1943.) Second progress report of California official pullorum disease program 1941-1942.—*Bull. Calif. Dep. Agric.* 32. 91-93. 1754

A short account of the progress made in eradicating pullorum disease from turkey flocks during the second year of the official programme.—J. D. BLAXLAND.

— (1946.) Outbreak of gastroenteritis—*Salmonella pullorum*.—*Bull. U.S. Army med. Dep.* 5. 248-250. 1755

From an outbreak of gastro-enteritis at an Army Air Base, involving 423 people sufficiently ill to require medical treatment, *S. pullorum* was obtained from the faeces of 11.7% of the 172 hospitalized patients. The infection probably originated from hens' eggs used in a rice pudding, but this could not be proved, as no specimens of the food were available by the time the epidemiological investigations were carried out.

—A. MAYR-HARTING.

KOCH, W. (1948.) Versuche mit Weizenkeimöl bei seuchenhaftem Verkalben. [*Vitamin E* in treatment of abortion in cattle.].—*Tierärztl. Umsch.* 3. 243-244. 1756

Pregnant rats that had been on a vitamin E deficient diet aborted when about half-way through the gestation period.

K. treated 717 pregnant cows infected with *Brucella abortus* with three doses of vitamin E varying from 20-40 mg., administered subcutaneously in the first or second month, in the third or fourth and in the fifth or sixth month of pregnancy. The results were unsatisfactory.

Further trials on 2,000 cows, sterile after infection with *Br. abortus*, also gave unsatisfactory results.—E. G.

HUDDLESON, I. F. (1948.) The potentiating action of sulfonamides on the brucella antibody-

complement system.—*Amer. J. vet. Res.* 9. 277-285. 1757

The temporary growth inhibiting effect of soluble sodium sulphonamide compounds on *Br. abortus*, *Br. suis* or *Br. melitensis* in liquid media is enhanced to give a bactericidal effect by the addition of fresh serum from normal rabbits or cows.

G. pigs fed sulphadiazine seven days after infection with *Br. suis* were found to be free from infection P.M., but the drug had no effect on the course of the disease when administered 28 days after infection. H. considers that this therapeutic effect of sulphadiazine on brucellosis is due not to its direct action on the organisms but to its action in combination with the antibody-complement system. This complex system is ineffective with a high antibody concentration.

—J. I. TAYLOR.

LEWIN, W., BERSOHN, I., & RICHARDSON, N. (1948.) *Brucella* agglutinins. Their occurrence in Witwatersrand milk supplies and in the serum of normal persons.—*S. Afr. med. J.* 22. 763-765. [Authors' summary copied *verbatim*.] 1758

A total of 212 composite samples of milk distributed for consumption on the Witwatersrand were submitted to whey agglutination tests. *Brucella* agglutinins were present in 70 per cent.

Of 92 samples of milk subjected to a biological test for *brucella* organisms, three yielded positive results.

Agglutinins were present in the serum to a titre of 1:40 in three of 200 normal blood donors in one to a titre of 1:20 and in four to a titre of 1:10. It is suggested that a diagnostic yield of 1:100 be used on the Witwatersrand as indicative of active infection.

BUZENAC, J. (1948.) Une anémie infectieuse du chien: l'anémie pernicieuse. [An infectious form of anaemia in the dog.]—*Rec. Méd. vet.* 124. 110-123. 1759

B. describes a clinical entity in dogs characterized by high fever, anaemia and dark urine. He observed it as a complication in other canine diseases, most commonly piroplasmiasis. He distinguishes an acute type of about ten days' duration and a sub-acute type lasting 3-4 weeks, both invariably fatal. Microscopic changes in the blood are those typical of anaemia with a marked increase in polymorphs. Spleen smears reveal among other organisms a clostridium, resembling *Cl. welchii*. Isolation and identification of the organism was not attempted, despite which the author believes it to be implicated in this disease. Eight such cases are described.—G. V. LAUGIER.

EDWARDS, P. M., & WOOD, W. W. (1948.)

Myanesin in tetanus.—*Lancet*. 255. 807-809. [Authors' conclusion copied *verbatim*.] 1760

The beneficial effect of myanesin in this case was so obvious that it is hoped that it may be given an extended trial in further cases, including its exhibition by mouth as well as by intramuscular and intravenous injection.

MUELLER, J. H., & MILLER, P. A. (1948.) Unidentified nutrients in tetanus toxin production.—*J. Bact.* 56. 219-233. [Authors' conclusions copied *verbatim*.] 1761

A tryptic digest of commercial casein contains at least two substances destroyed in ordinary acid or alkaline hydrolysis that appear essential for the production of potent tetanus toxin under the conditions of these experiments.

Fairly strong toxin has been obtained from tryptic digests of "vitamin-free" casein and of bovine albumin and hemoglobin, indicating the probability of a widespread distribution of the compounds or groupings involved. The possibility that the trypsin preparation contributes in some way to the effect has not yet been excluded.

The most promising procedure for the isolation of the substances which are concerned appears at present to be an initial separation by "counter-current" extraction with phenol, followed by chromatographic fractionation on starch columns.

By this means phenylalanine has been identified as being concerned in toxin formation, and a concentrate, active at a level of 0.2 to 0.4 mg in 20 ml of medium, has been obtained, but not as yet in a sufficiently pure condition for chemical characterization. Further investigation of this material, as well as of the one or more additional unknown components of the basic medium, is in progress.

I. WYNNE, E. S., & FOSTER, J. W. (1948.) Physiological studies on spore germination, with special reference to *Clostridium botulinum*. III. Carbon dioxide and germination, with a note on carbon dioxide and aerobic spores.—*J. Bact.* 55. 331-339. 1762

II. FOSTER, J. W., & WYNNE, E. S. (1948.) Physiological studies on spore germination, with special reference to *Clostridium botulinum*. IV. Inhibition of germination by unsaturated C₁₈ fatty acids.—*Ibid.* 495-501. [Authors' summary copied *verbatim*. For previous parts, see *V. B.* 19. 198.] 1763

I. For germination of spores, apart from further vegetative development, CO₂ is essential. The CO₂ of the atmosphere can be replaced by addition of certain complex biological substances to the medium. Of these, yeast extracts are most effective, liver and brain heart extracts less so. A few defined substances, in particular oxalacetic acid, also permitted by-passing CO₂.—A. M.-H.

II. Oleic, linoleic, and linolenic acids have been shown to be strongly inhibitory to the germination of spores of six strains of *Clostridium botulinum*, linolenic being most effective; stearic acid was completely inactive. Spores of *Clostridium perfringens* and putrefactive anaerobe no. 3679 were less inhibited, whereas spores of *Clostridium histolyticum* and *Clostridium chauvei* were only slightly affected by oleate. Spores of four aerobic species were unaffected. Oleic acid in a concentration of 100 μ g per ml prevented germination of large spore inocula of *C. botulinum* over 4½ months.

Vegetative cells of *C. botulinum* are not inhibited by these acids.

Oleate at 100 μ g per ml is not sporocidal itself, as killing was not observed in distilled water but only in a complete medium (brain heart).

The degree of effectiveness of these C_{18} acids in suppressing germination was greatly different in two different lots of the same medium.

The effect of inhibitory substances in nutritionally adequate media may cause more conflicting results in bacteriology than is now appreciated. Starch (0.1 per cent) can neutralize fatty acid type inhibitors and possibly other types.

EMMONS, C. W., & ASHBURN, L. L. (1948.) *Histoplasmosis in wild rats.*—*Publ. Hlth Rep., Wash.* 63. 1416-1422. [Authors' summary copied verbatim.] 1764

Typical strains of *Histoplasma capsulatum* have been isolated from 16 feral rats (*Rattus norvegicus*) and one mouse (*Mus musculus*) trapped in Loudoun County, Virginia. No association was observed between these rodent cases and the previously reported human cases of the disease in this area.

The microscopic lesions were small epithelioid granulomata in which fungi were generally few in number. *Histoplasma* was found also in monocytes outside of lesions. It is suggested that the frequent occurrence of *H. capsulatum* in the common brown rat may be important in the endemicity of histoplasmosis in many widely separated areas of the world. The data suggest that *H. muris* should be reduced to synonymy.

NEILL, J. M., CASTILLO, C. G., SMITH, R. H., & KAPROS, C. E. (1949.) *Capsular reactions and soluble antigens of Torula histolytica and of Sporotrichum schenckii.*—*J. exp. Med.* 89. 93-106. [Authors' summary copied verbatim.] 1765

The present paper deals with reactions between antisera and the capsules of *Torula histolytica* (*Cryptococcus hominis* or *Torulopsis neoformans*) and of *Sporotrichum schenckii*. The reactions, although similar in principle to the capsular swelling seen in *Quellung* tests of bacteria,

present a special interest because the microorganisms are larger in size and more complex in structure than bacteria.

That the reactions on the capsules were caused by immunologically specific antibodies was shown by the fact that the capsular reactivity of the sera was directly related to their capacities to agglutinate suspensions and to precipitate soluble antigens of *Torula* and of *Sporotrichum*, and by the fact that the capsular reactivity was removed from the sera by absorption with soluble antigens of the respective fungi.

The soluble antigens included partially purified products from broth cultures of *Torula* and of *Sporotrichum*, a partially purified product from *Sporotrichum*-infected mice, and a purified polysaccharide from a culture of *Torula* grown in a synthetic medium. The purified polysaccharide was highly reactive in precipitation tests with unabsorbed serum, and its ability to absorb the *Torula* capsular reactivity from the sera indicates that the major antigens on the surface of encapsulated *Torula* cells are polysaccharides, identical with or similar to the product used in the present study.

PINETTI, P. (1948.) *Studi sulla biologia dei dermatomiceti. II. Capacità di assimilazione degli idrati di carbonio ed attività fermentative glicolitiche di alcuni dermatomiceti. [Biology of Dermatormycetes.]—Mycopath., The Hague.* 4. 222-234. [Abst. from English summary.] 1766

P. studied the carbohydrate metabolism and fermentative activity of 94 species of recently isolated Dermatormycetes including four species of *Microsporum*, two species of *Achorion*, ten species of *Epidermophyton inguinale* and 78 species of *Trichophyton*, including *T. violaceum*, *T. cerebriforme*, *T. gipseum*, *T. plicatile*, *T. fumatum*, etc.

Details are given of the method used to estimate the capacity to assimilate various sugars and the results which were given in detailed tabular form were of use in differentiation of the species. The results obtained from a study of fermentative activities on similar sugars appeared to be of little value.—E. M. J.

COSTIGAN, P. G. (1947.) *A case of actinomycosis treated with streptomycin.*—*Canad. med. Ass. J.* 56. 431. 1767

A human case of actinomycosis of the lower jaw was treated successfully after failure of several other drugs by 250,000 units of streptomycin given intramuscularly in two and a half ml. of sterile water every three hours the treatment being continued for five days.—J. F. A. SPRENT.

SJOLTE, I. P. (1948.) *Spirochaetosis cuniculi.*

[Spirochaetosis in rabbits.]—Maanedsskr. Dyr-læg. 60. 217-224. 1768

A first record of rabbit spirochaetosis in Denmark with a detailed description of two cases. —J. E.

PROBEY, T. F. (1948.) **Attempt to produce an arsenic-resistant strain of *Spirochaeta pallida* in experimental syphilis.**—*Publ. Hlth Rep., Wash.* 63. 1654-1659. [Author's summary copied verbatim.] 1769

The Nichols strain of *S. pallida* in experimental syphilis in rabbits was not rendered "arsenic resistant" by the sub-curative treatment schedule employed in this study: (1) large single dose and (2) multiple small doses of neoarsphenamine. The variation between the curative dose of neoarsphenamine in the experimental infection with the "resistant" strain and the normal strain, 40 mg. and 30 mg. per kg., respectively, is within the limits expected in experimental infection.

BAKER, J. A., & LITTLE, R. B. (1948.) **Leptospirosis in cattle.**—*J. exp. Med.* 88. 295-307. 1770

An infectious disease of dairy cows, the main feature of which was abnormal milk, was investigated. There was no abortion or icterus and haemoglobinuria was rare. The infectious agent, probably a leptospira, was transmitted to g. pigs, rabbits, mice, embryonated hen eggs and to cattle. The organism caused a generalized infection with localization in the kidney, producing an interstitial-nephritis, and it persisted in the kidney long after it had disappeared from the blood. It is suggested that natural infection may be by droplet infection following urinary excretion by affected animals, but the possibility of insect vectors is not excluded.

The organism appears to be a leptospira and antibodies were found in the sera of experimental animals and of cows recovered from the natural disease.—A. R. JENNINGS.

BROOM, J. C. (1949.) **The protective value of leptospiral vaccines in hamsters.**—*Vet. Rec.* 61. 127-128. 1771

For vaccines, B. used cultures of leptospira 5-10 days old, containing approximately 10^7 organisms per ml., and 0.5% phenol. Hamsters were given two doses of 1 ml. or three doses of 0.5 ml. at weekly intervals and immunity was established a week after the final dose.

Vaccines of *L. icterohaemorrhagiae* and *L. canicola* protected the hamsters against homologous infection. *L. canicola* vaccine induced

partial immunity to *L. icterohaemorrhagiae* infection but *L. icterohaemorrhagiae* vaccine gave no protection against *L. canicola*. B. thinks therefore that in dogs, a breakdown following the use of *L. icterohaemorrhagiae* vaccine may result from *L. canicola* infection, and that vaccination in Great Britain should be bivalent.—I. W. JENNINGS.

SHIRLAW, J. F., & IYER, P. R. K. (1948.) **Studies on contagious bovine pleuropneumonia in Assam.**—*Indian J. Vet. Sci.* 16. 191-208. 1772

The prevalence in Assam of an acute virulent form of bovine contagious pleuropneumonia involving 100% mortality is confirmed. The authors made a detailed comparative study of the Assam strain of pleuropneumonia and strains obtained from Kenya and Australia. Lesions closely resembling those found in the field, including some hitherto undescribed ones in the spleen and abomasum of experimental animals, are described. Buffaloes seem to be immune to the disease in Assam. For immunization William's tail tip method of vaccination with some modification is recommended.

—C. M. SEN GUPTA.

PAINE, T. F., Jr., & FINLAND, M. (1948.) **Observations on bacteria sensitive to, resistant to, and dependent upon streptomycin.**—*J. Bact.* 56. 207-218. 1773

Streptomycin resistant and streptomycin dependent variants of various species of bacteria were obtained. Resistance once acquired, appeared to be a permanent feature involving the entire progeny of an organism, whereas the dependent strains frequently mutated, sometimes becoming sensitive or sometimes resistant strains when grown under sub-optimal conditions. Both sensitivity and dependence may be related phenomena.

Colonially, morphologically and biochemically, the three variants were the same, although under sub-optimal conditions the dependent variant had extreme pleomorphism. Differences when the three variants were tested with other antibiotics were not apparent.—M. S. BROOKE.

PIJPER, A. (1948.) **Bacterial flagella and motility.** [Correspondence.]—*Nature, Lond.* 161. 200-201. 1774

Additional evidence is adduced for P.'s views of the nature of bacterial flagella from a microfilm showing a semi-somersault movement. Momentum carries the organism as a whole forward and the tail remains relatively unmoved, although the gyrating, undulating movement of the body stops as it performs a semi-somersault.—A. M. B.

DISEASES CAUSED BY PROTOZOAN PARASITES

GRUNERT, Z. (1948.) Srovnávací štúdia spol'ahlivosti serologických method pri dourine. [Comparative studies upon the value of serological methods in the diagnosis of dourine.]—*Čas. československ. Vet.* 3. 685-694. 1775

The sera of 50 *Trypanosoma equiperdum* infected or suspected horses was tested by four methods: complement-haemagglutination, complement-fixation, formol-gel and agglutination.

The agglutination test proved to be the most sensitive, yielding 41 positive and nine negative reactions. The difficulty was the poor keeping quality of the trypanosome suspension and frequent auto-agglutination. G. does not recommend it for tests on a large scale.

The formol-gel test is the simplest and although it reacts also to glanders, this can be overcome by a subsequent mallein test. The results were: 34 positive, nine doubtful and seven negative.

The complement-haemagglutination test is a modified complement-fixation test. Normal horse serum is used as complement, normal inactivated cattle serum as amboceptor and g. pig blood cells are substituted by sheep blood cells.

The results achieved with this test using a watery antigen were identical with the results of the complement-fixation test: 31 positive, seven doubtful and 12 negative. When alcoholic antigen was used there were 20 positive, four doubtful and 26 negative reactions.—E. G.

HYER, A. R. (1948.) Surra in Bovines—some uncommon symptoms.—*Indian Vet. J.* 24. 298-299. 1776

In addition to the usual symptoms of surra, the author describes some uncommon symptoms observed by him in bullocks and a cross-bred heifer calf. Blood smears from all these animals were positive for *T. evansi*. The importance of demonstration of parasites in the blood for positive diagnosis is stressed.—M. M. SINGH.

BARNETT, S. F. (1947.) Bovine trypanosomiasis in Kenya, with special reference to its treatment with phenanthridinium 897.—*Vet. Rec.* 59. 459-462. 1777

The important pathogenic trypanosomes of cattle in Kenya are *T. congolense* and *T. vivax*. Two field experiments are described in which phenanthridinium 897 (phenidium chloride) and the antimonials, antimosan and stibophen, were used in treatment.

The first experiment was made on a herd of cattle on a farm situated outside a fly-belt. The infection, probably introduced by *Glossina* but spread by *Stomoxys*, had been present for more than nine weeks. Only *T. congolense* was found

in smears. Most of the cases were treated with 897 at an estimated dose-rate of 2 mg. per kg. intravenously. A few animals received weekly injections of stibophen for five weeks and all relapse cases were treated with 897. Owing to the fact that they were subjected to greater strain by being walked several miles daily to find grazing the milk herd did not respond to treatment as well as did the dry herd. The percentages cured in 100 days were 55.1% in the milk herd and 75.5% in the dry cows and steers. The ratios of percentage mortality to percentage incidence were 1:8.2 in the milk herd and 1:13.7 in the other. After many months all cases of trypanosomiasis were cured, the farm remaining free of infection for three years.

In the second experiment a batch of slaughter cattle travelling through a fly-belt to Mombasa was involved. Both *T. congolense* and *T. vivax* were present. Some 2,000 cattle were examined and those having trypanosomes or clinical signs were treated with 897, either intravenously or intramuscularly, or stibophen or antimosan either intramuscularly or subcutaneously. On arrival at Mombasa, 23-34 days later, 769 head were examined again for relapses and re-infections. Phenanthridinium 897 gave better results than the two antimonials and intramuscular injections proved more satisfactory than intravenous.

The advantages and disadvantages of the drugs used are discussed.—J. RICHARD HUDSON.

FRIEDHEIM, E. A. H., & BERMAN, R. L. (1946.) An organic antimony compound with curative and prophylactic activity in experimental trypanosomiasis.—*Proc. Soc. exp. Biol., N.Y.* 62. 131-132. 1778

A sodium salt derived from *p*-(2,4-diamino-1,3,5-triazinyl-6) aminophenylstibonic acid has a marked prophylactic action in *T. equiperdum* infection in mice and cures this infection without relapse, with a single intraperitoneal dose representing one two hundredth of the maximum (100%) tolerated dose.—W. R. BETT.

HAWKING, F. (1948.) Growth of protozoa in tissue culture. V. *Leishmania donovani*.—*Trans. R. Soc. trop. Med. Hyg.* 41. 545-554. 1779

L. donovani was grown in tissue culture at 37°C. using a technique previously described for *Plasmodium gallinaceum*. Cultures were made from the spleen of infected hamsters, but rabbit serum was substituted for hamster serum in the fluid phase of the medium.

Vigorous growth of the leishmania was maintained up to about 83 days. As early as the second day, leishmania were found in the monocytes

migrating out from the explant and, later, were present in monocytes and macrophages throughout most of the culture. They appeared as typical leishmania forms. In most of the cultures maintained for more than 16 days, however, the leishmania were liberated from the cells and formed great masses of extracellular flagellates at 37°C. The stimulus responsible for this is not clear, and the possibility of such growth of the leptomonad form at body temperature has not been generally recognized.

The various stages in flagellate development are described and illustrated in detail. Among the flagellates growing at 37°C., peculiar colonies were found consisting of pyriform or polygonal parasites closely adherent to each other. Infection was easily transmitted to cultures of clean spleen grown in the same flask as an infected culture. Flagellates from cultures at 25°C. added to clean cultures at 37°C. produced leishmanial forms in the cells and flagellate forms in the fluid medium.—G. M. U.

CARNEVALE, A. (1947.) La velocità di diffusione di un elettrolita (HCl), nel gel-serico, nella leishmaniosi interna. [Diffusion speed of an electrolyte in frozen kala azar serum.]—*Pediatrics*. 55. 81–86. [Abst. in *Trop. Dis. Bull.* 45. 507. (1948), copied *verbatim*. Signed: C. M. WENYON.] 1780

The author has found that an electrolyte (HCl) diffused more rapidly in serum gel of 14 of 15 cases of infantile kala azar (the normal rate being 44–47 mm. in 24 hours). This increase to 48–51 mm. appears to be related to the alteration which occurs in the albumin/globulin relationship, the globulin being increased in kala azar. In 7 healthy children, a rate of 45 or 46 was obtained. The technique, which consists essentially of gelification of the serum with propionic acid, and then adding a layer of HCl and observing penetration of the latter by colour change in Congo red previously incorporated, is described.

MORGAN, B. B. (1947.) A summary of research on *Trichomonas foetus*.—*J. Parasit.* 33. 201–206. 1781

The summary gives a brief history of the disease and indicates its world-wide distribution. The pathogenesis is discussed and the possibility of non-venereal transmission by flies suggested. The condition is self-curing in most cows, but bulls remain permanently infected.

Serological diagnostic methods are summarized, but positive diagnosis still depends on the demonstration of the motile parasite in genital exudates or foetuses.

The lack of knowledge of the mechanism of trichomonad immunity is emphasized, and in vaccination studies on heifers, M. noted that there

seemed to be no correlation between the immobilization titre of the sera and the degree of protection.

Artificial insemination is of value and while there is no specific therapy M. considers that iodide treatment shows promise in bull infections. —G. M. URQUHART.

MORGAN, B. B. (1948.) The fertility of bovine spermatozoa treated with immune sera for the control of trichomoniasis.—*J. Anim. Sci.* 7. 247–250. 1782

One hundred and one cows and heifers were artificially inseminated with semen from a trichomonad infected bull and with semen from a normal bull to which *Tr. foetus* had been added. The semen was diluted with either raw or hyperimmune bovine serum to inactivate or destroy the trichomonads. Twenty cows became pregnant and calved normally. Artificial insemination of 20 control animals with normal undiluted semen resulted in 17 pregnancies. Twenty control cows bred artificially with semen from an infected bull resulted in four normal calvings. Sixteen of these control cows contracted trichomoniasis, though none of the cows inseminated with semen plus raw or hyperimmune serum developed trichomonad infection. The method is unpractical unless the spermaticidal effects of bovine sera can be removed.—G. M. URQUHART.

BARTLETT, D. E. (1948.) Further observations on experimental treatments of *Trichomonas foetus* infection in bulls.—*Amer. J. vet. Res.* 9. 351–359. 1783

Eight bulls infected with *Tr. foetus* were each treated with five doses given intravenously at intervals of 48 hours, each dose consisting of 5 g. NaI per 100 lb. body weight, in 500 ml. sterile water. Two of the eight bulls were cured.

Of 19 infections in 17 bulls treated with iodides, ten infections were terminated. Two cures were obtained with orally administered KI, and eight cures with intravenous injection of NaI. Several of these bulls required more than one treatment, so drug-fastness does not appear to be a significant consideration.

B. comments on the fact that nine successes out of 12 trials were obtained during March–August, while only one success in 19 trials was recorded during October–March. Iodine appears in the prepuce in chemically detectable concentrations following oral and intravenous administration.

In an investigation of trichomonacidal agents which could be directly applied to the genital membranes, one bull was treated by intrapreputial insufflation with a silver-protein powder three times weekly for six weeks. Another bull was

treated on two occasions by direct application of trypaflavine in a water-soluble ointment base. In both bulls the infection persisted. Eight more bulls were treated with G.P.C., a German proprietary compound containing trypaflavine, as a topically applied ointment. Seven bulls were cured by a single treatment (two applications) and one was not cured despite two treatments.

B. considers that G.P.C. possesses therapeutic properties for trichomonad-infected bulls, and that its effectiveness depends not so much on its trypaflavine content as on its other ingredients which permit contact and penetration of mucous membranes. Negative preputial samples up to three months after treatment are of little significance and recovered bulls are susceptible to infection.—G. M. URQUHART.

WEISS, E. D., & BALL, G. H. (1947.) **Nutritional requirements of *Tritrichomonas foetus* with special reference to partially digested proteins.**—*Proc. Soc. exp. Biol., N.Y.* 65. 278-283. 1784

Three media, broth-serum-glucose (BSG), agar-serum (AH), and egg-serum-Locke (ESL), were compared to determine the differences in the growth response of *Tr. foetus*. Growth was slowest in AH, probably owing to the viscosity of the agar. In BSG, growth reached its peak rapidly, and fell rapidly. The rapid growth was possibly due to the presence in the medium of partially-digested beef proteins.

The amino-acid requirements of *Tr. foetus* were found by using the complete amino-acid medium of Kidder & Dewey, and removing one amino-acid at a time. The essential amino-acids were found to be arginine, glycine, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, proline, secine, threonine, tryptophane, and valine. Negligible growth occurred in the absence of certain of these acids, possibly indicating the ability of *Tr. foetus* to synthesize certain acids slowly.

In the complete amino-acid medium growth was improved on the addition of serum. Casein, lactalbumin, and wheat germ protein were tested for their growth properties. The response to whole protein was very low and not measurable without the addition of serum. In enzyme digests of these proteins, growth improved until the percentage of soluble nitrogen reached 50%. As digestion continued and more nitrogen went into solution, the growth rate decreased. This may have been due to destruction of streptogenin.

—G. M. URQUHART.

BISWAL, G. (1948.) **Coccidiosis in buffalo calves.**—*Indian Vet. J.* 25. 36-38. 1785

Coccidiosis is the second most important

disease in buffalo calves in the Government Dairy of the Milk Supply Scheme at Cuttack (Orissa). Buffalo calves from 1-8 months old are affected. The symptoms are those of acute dysentery. Microscopic examination of faecal samples revealed *Eimeria* oocysts [species not named].

B. treated six buffalo calves with sulphamethazine at the rate of 12.5 g. per 100 kg. on the first day, a half dose being given on the second and subsequent days for 4-6 days. The six calves treated recovered.—P. R. K. IYER.

SKJERVEN, O. (1948.) Sulphamezathine mot coccidiose hos kyllinger. [Sulphamezathine (sulphamethazine) in control of coccidiosis in chickens.]—*Norsk VetTidsskr.* 60. 412-414. 1786

S. describes successful trials of sulphamethazine in solution and in powder form during a severe outbreak of coccidiosis in a flock of 1,000 month-old chickens. He found that equally good results were obtained with 16% sulphamethazine sodium solution given in the drinking water for three days, and with 0.05-0.1 g. powdered sulphamethazine per bird per day, given mixed with the mash for five days, but preferred the former, more convenient method. Regarding toxicity, he found that chickens were able to tolerate considerably larger doses than those recommended.—F. E. W.

SOUSA, J. M. P. L. (1947.) Coccidiose em columbideos. [Eimeria infection in pigeons.]—*Repos. Lab. Pat. vet., Lisboa.* 6. 389-392. [English, French & German summaries.] 1787

The author describes an outbreak of coccidiosis in pigeons, characterized by weakness, emaciation, diarrhoea and, just before death, dysentery and paralysis. The course of the disease as a rule was about three weeks, the younger birds being most often affected. On P.M. examination, the lesions were congestion of the small intestine and caeca, sometimes haemorrhagic enteritis. Intestinal scrapings and faecal smears revealed massive infestation with oocysts, identified as *Eimeria labbeana*, and measuring $16-24 \times 16-12\mu$. On cultivation they developed sporocysts, more or less ellipsoid, pointed at one end and rounded at the other, each containing two ill-defined sporozoites.—I. W. JENNINGS.

MOSNA, E. (1947.) Un nuovo metodo di produzione *in vitro* del processo di flagellazione dei microgametociti dei parassiti malarigeni. [Flagellation of microgametocytes of malaria parasites *in vitro*.]—*Riv. Parassit.* 8. 63-65. [Abst. in *Trop. Dis. Bull.* 45. 136. (1948), copied verbatim. Signed: C. M. WENYON.] 1788

Two or three drops of blood are removed

from the comb or from a vein of the wing of a fowl infected with *Plasmodium gallinaceum* on to a slide and mixed with an equal quantity of a 3 per cent. solution of citrate of sodium. By rocking the slide, a homogenous mixture is obtained. A very thin cover glass is placed on the mixture in such a manner that no pressure is applied. On examining the preparation microscopically it will be noted that the red cells arrange themselves in a floral design, the centre of which will be found to be a flagellating microgametocyte. The observations were repeated with human blood containing *P. vivax*, but the floral arrangement was not so marked as in the case of fowl's blood. As a modification of the method, the blood can be taken into a syringe containing the citrate solution and the mixture run on to the slide for observation.

PURCHASE, H. S. (1947.) **Piroplasmosis in foal at birth.**—*Vet. Rec.* 59. 449. 1789

In a short note P. reports the occurrence of *Babesia caballi* in blood smears made from a foal a few hours after birth. Although treated, the foal died before it was 24 hours old. A smear of the mare's blood, made the morning after the foal was born, was negative: but in all probability the mare was a carrier.—J. RICHARD HUDSON.

VOGELSANG, E. G., RODIL, T., GALLO, P., & ESPIN, J. (1948.) *Babesia argentina*. Localización cerebral en el bovino. [Cerebral infection with *B. argentina* [*B. bovis*] in a cow.]—*Rev. grancolomb. Zootec. Hig. Med. vet.* 2. 269-284. [English, French & German summaries.] 1790

The authors describe a case of *Babesia* infection in a five-year-old cow, with symptoms which gave rise to suspicion of paralytic rabies. P.M. examination revealed congestion of the blood vessels of the brain and meninges. Microscopic examination of sections of the cerebrum revealed hypotrophic degeneration, resulting from blockage of the capillary blood vessels with red blood cells, 75-90% of which contained *Babesia*. The appearance closely resembled that of the cerebral form of human malaria.—I. W. JENNINGS.

WESTERMARCK, H. (1948.) Punataudin vastustamisesta uusilla virtsa-ainejohdannaisilla ja verensiirtoterapialla. [Treatment of bovine piroplasmosis with carbamides and blood transfusions.]—*Suom. Eläinlääkäril.* 54. 287-292. 1791

Piroplasmosis is a disease of some seriousness in Finland. The causal organisms are said to be *Babesia bovis* and *Francaella caucasica*. Some years ago treatment was carried out by silver salts, but these became displaced to some extent by acaprin. The author recently tried babesan and piproparv which he judges to be as good as acaprin [they are identical]. Treatment with these drugs

alone is satisfactory in the early stage, but in advanced cases chemotherapy requires to be supplemented by blood transfusions from normal cattle, the amount given being 3-4 l. Circulatory stimulants are sometimes employed also. With this treatment the recovery rate is excellent (90-99%).—J. E.

BLACK, R. H. (1948.) **The resorption of haemoglobin by the renal tubules in haemoglobinuria.**—*Ann. trop. Med. Parasit.* 42. 90-94. 1792

As a result of his observations on the kidneys of a dog which died from *Babesia canis* infection, the author examined the kidneys of a monkey with *P. knowlesi* infection, two rats, one with phenylhydrazine poisoning and one with *Bartonella muris* infection, two from man, one with blackwater fever and one from a case of incompatible transfusion, and a mouse injected intravenously with lysed blood.

In all these cases, eosinophilic granules were found in the convoluted tubular cells. These are liberated by degeneration of the cells and are found in the lumen forming part of the tubular debris. On a basis of staining reactions, B. concluded that these granules were haemoglobin. B. discussed these findings and concluded, from the available evidence, that the haemoglobin was derived from the glomerular filtrate and the granules were formed within the cells.—J. A. J. VENN.

PRASAD, B. M. (1947.) **Studies on the haematology of dogs in health and when infected with *Babesia gibsoni* (Patton 1910).**—*Indian J. Vet. Sci.* 17. 135-138. 1793

P. obtained precise data on the total red and white cell counts, the differential white cell counts and the haemoglobin content of the blood of dogs in health and when infected with *B. gibsoni*. Out of three apparently healthy dogs from 2-4 years old, two were infected artificially with the parasites and the third was kept as control. No significant change was noticed in the blood of two infected animals during the incubation period, but the red cell count fell to about one million per c.mm. during the disease. The white cell count increased to a peak of nearly 80,000 per c.mm. but the number gradually returned to normal level both in the fatal and recovered cases. During the period of marked leucocytosis a mild neutrophilia, slight lymphopenia, eosinopenia, and a shift to the left of the neutrophiles was observed. The percentage of different types of cells gradually returned to normal in the recovering case but in the case of fatal infection monocytosis persisted. The average haemoglobin content dropped to 12.5% from normal. A considerable decrease in the total red cell count and the marked fall in haemoglobin were the salient features of *B. gibsoni* infection.—S. HARBANS.

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

ANON. (1948.) **Congressman Gillie's report on foot-and-mouth disease.**—*J. Amer. vet. med. Ass.* 112. 196-197. 1794

This is an abridged version of an address by G. on the F. & M. disease eradication campaign in Mexico. The following reasons are given for the failure of the United States-Mexican Commission's slaughter policy: (1) failure to realize the complexity of the undertaking; (2) difficult terrain and lack of roads in Central Mexico; (3) poor public relations; (4) lack of support from Mexican farmers; and (5) politics. The basis of the revised campaign against the disease in Mexico will be the holding of a quarantine line immediately north of the present infected area with a sterile zone, as wide as possible south of such a line, in which all infected or exposed animals will be immediately slaughtered and buried. This sterile zone will be gradually extended southward as rapidly as circumstances permit with vaccination being employed by the Commission as an adjunct to quarantine. The quarantine line runs westward from near Tampico on the Gulf coast to a point north and west of Guadalajara, thence southwest to the Pacific.

—W. M. HENDERSON.

ZULOAGA, E. E. P. (1947.) **Cultivo del virus aftoso sobre tejidos fetales de origen bovino. [Cultivation of foot and mouth disease virus on bovine embryonic tissues.]**—*Rev. Med. vet., B. Aires.* 29. 764-780; 869-880; & 961-968. 1795

A review is given of the standard methods of tissue culture with a short description of Z.'s use of the bovine embryonic tissue method for the culture of F. & M. disease virus.—W. M. H.

ROSENBUSCH, C. T., DECAMPS, A., & GELORMINI, N. (1948.) **Intradermal foot-and-mouth disease vaccine. Results obtained from the first million head of cattle vaccinated.**—*J. Amer. vet. med. Ass.* 112. 45-47. 1796

This is a report of a paper read by the authors which includes important claims but, no doubt owing to limitations of space, gives no detailed supporting evidence. Using an aluminium hydroxide vaccine the main differences in technique from that usually employed are (1) a high virus content of 5%; and (2) a dose for cattle of 2 ml. administered intracutaneously.

Of one million vaccinated cattle, 7% proved to be insufficiently protected against the disease in the field; this included 5% of failures said to be due to incorrect vaccination, only the remaining 2% being attributed to possible deficiencies in the vaccine. It is stated that a new vaccine based on "a predominance of quick-acting virus strains"

produced complete polyvalent immunity within 24-36 hours of vaccination. It is also claimed that this intradermal vaccination is cheaper and produces a quicker and more lasting immunity than subcutaneous vaccination, that the response in young animals is better than with subcutaneous vaccination and that a tissue and not a humoral immunity is produced. Mention is made of results of type determination tests of Argentine strains of virus. No pure type strains were isolated as all were found to have some relationship to at least two types. Of 31 strains examined in 1946-47, eight corresponded mainly to type Vallée O, seven to Waldmann C and five to Vallée A. Eleven could not be classified as they appeared to be related to all three types.—W. M. H.

CARNEIRO, V., & CARDIM, W. H. (1947.) **A doença de Aujeszky em suínos no Brasil. [Aujeszky's disease in pigs in Brazil.]**—*Arq. Inst. biol., S. Paulo.* 18. pp. 243-252. [Abst. from English abst.] 1797

In previous papers (1939, 1941) [V. B. 11. 296; & 13. 352] the senior author demonstrated, by searching for neutralizing antibodies in pigs living in the foci of the disease in cattle, that this infection is very frequent in Brazil. In 80 samples of sera from seven foci in the interior of the state of São Paulo, 49, or 60% of the total, proved positive, but no results were obtained in attempts at isolating the virus from pigs or at detecting epizootics in store pigs.

In this paper an outbreak of the disease in store pigs is described for the first time in Brazil. In one lot of 150 young pigs, 34 died within 20 days. The virus was isolated from the brain, lungs and spleen of one of the dead store pigs in the focus.

Aujeszky's disease is a new mortality factor for store pigs in Brazil. For a definite diagnosis the isolation of the virus is necessary. All epidemiological and experimental data point to the pig as a carrier of the virus and a source of infection for cattle. The disease appears only in cattle living in contact with pigs and prophylactic measures consist in keeping the species separate. The virus was isolated on 34 occasions and about 60 foci were diagnosed on clinical grounds.

SELLERS, A. F., POMEROY, B. S., SAUTTER, J. H., PINT, L. H., & SCHRAFEL, C. E. (1949.) **Atypical pseudorabies and listeriosis in cattle.**—*J. Amer. vet. med. Ass.* 114. 69-73. 1798

Detailed case histories are presented of three animals affected with pseudorabies (Aujeszky's disease) and one animal with *Erysipelothrix* (*Listeria*) *monocytogenes* infection. Clinically the two conditions were very similar.—D. LUKE.

I. VEERARAGHAVAN, N. (1946.) Studies on the cultivation of the aetiological agent of rabies *in vitro* and its nature.—*Indian J. Med. Res.* 34. 207–224. 1799

II. VEERARAGHAVAN, N. (1946.) Studies on antirabic immunisation with culture vaccine.—*Ibid.* 225–236. 1800

I. The author evolved a simple cell-free medium containing 1.5% steamed sheep-brain extract, 2% sheep serum, 2.5% glycine and 0.15% peptone in which he successfully cultivated rabies fixed virus. In cultures inoculated with a 20% cell-free suspension of infected sheep brain and incubated anaerobically for 12 hours at 37°C. he achieved a virus concentration of at least five times that obtained in brains of infected sheep used in the manufacture of antirabic vaccine. Addition to the medium of accessory factors such as thiamine hydrochloride, pyridoxine hydrochloride, calcium pantothenate, nicotinic acid and riboflavin is reported to have yielded a much higher titre of the virus.

The ability of the virus to multiply in a medium devoid of living or growing cells is presented as further evidence to support the view, put forward in an earlier paper, that the aetiological agent of rabies is not a virus in the fully-accepted sense of the word.

II. Antirabic vaccine prepared from tissue cultures of rabies virus in a cell-free medium, described in the previous paper, after the addition of 0.5% phenol was found to be superior to the ordinary phenolized sheep brain vaccine when tested for its immunizing power in g. pigs by a modification of Habel's mouse test. Other advantages of the vaccine reported are: its higher virus content, thus allowing a much smaller volume to be injected, the accuracy with which its virus content can be determined and its lower brain protein content.—M. R. DHANDA.

WRIGHT, J. T., BELL, J. F., & HABEL, K. (1948.) Benzene-ether extracted rabies vaccine.—*Science*. 108. 118–119. 1801

The lipoids of rabies brains were extracted by treatment with various solvents and the antigenicity of the residue tested. Benzene extracted residues had much higher antigenic value than residues extracted with acetone, carbon tetrachloride or dichlorethylene.

Benzene failed to kill the rabies virus. Extraction of rabies vaccine with cold benzene followed by cold ether removes most of the lipoids. Rabies vaccines killed with ultra-violet light and extracted with benzene and ether do not lose antigenicity but are generally improved as antigens.—M. C.

LALL, H. K., SINGH, G., & SINGH, J. (1947.)

An outbreak of goat-pox in Hissar district. (Punjab).—*Indian J. Vet. Sci.* 17. 243–246. 1802

The authors record an outbreak of goat pox of low virulence in the dairy flock of goats at the Government Livestock Farm, Hissar (Punjab). The source of infection was traced to goats which had been in contact with kids artificially infected with material from an outbreak in Hissar district and which had then been transferred to the main dairy flock. It is suggested that the incubation period may be long, since these goats developed symptoms six weeks after transfer. Mortality was low, but there was an appreciable reduction in milk yield. Experimentally the cow, buffalo and sheep could not be infected with the pox material from goats, but lambs could be infected. Goats inoculated with glycerinated or serum sensitized virus as well as uninoculated control goats failed to contract the disease when exposed to the natural infection. These inoculated and control goats were tested for immunity six months later with goat pox virus obtained from the Indian Veterinary Research Institute, Mukteswar, and all of them reacted. The immunity trials were inconclusive.—T. P. BANERJI.

MAGILL, T. P., & SUGG, J. Y. (1948.) The reversibility of the O-D type of influenza virus variation.—*J. exp. Med.* 87. 535–546. [Authors' summary copied *verbatim*.] 1803

Data are presented which enhance the idea that the influenza virus is an unstable agent. They indicate that the O-D type of variation is not a discontinuous mutation but rather is a reversible phenomenon. The O and D forms of virus both appear to be inherent in the virus particle; the dominance of one or the other form seems to be subject to chance occurrences, but is influenced by the conditions under which the virus is propagated.

The capacity of the O form of virus to agglutinate guinea pig but not chicken erythrocytes is a relative, not an absolute phenomenon; allantoic fluids which exhibit clear-cut O form haemagglutination may be made to exhibit D form merely by addition of suitable buffer to the test system. That point is of importance from the viewpoint of the mechanism of influenza virus haemagglutination.

GENINAZZA, S., MAGALLANES, N., & BIGLIERI, J. DE F. (1947.) La influenza suina en el Uruguay. [Porcine influenza in Uruguay.].—*Bol. mens. Direcc. Ganad., Montevideo*. 29. 130–141. 1804

The authors found that apparent breakdowns in swine fever crystal violet vaccination were due to the occurrence of swine influenza infection. Diagnosis was made on epidemiological clinical and pathological findings, and was supported by

the fact that the disease, although spread by contact, could not be spread by subcutaneous inoculations of large amounts of blood from the sick animals. The pigs affected were over three months of age, and in addition to the usual influenza lesions, some of them (3-5%), which had nervous symptoms, had oedema and congestion of the meninges, blood clots in the cerebellum, and small brain abscesses. *Haemophilus suis* was isolated from the cerebrospinal fluid of such cases. Of the many treatments applied, arsenical preparations and injections of convalescent whole blood were the most effective. The latter, used both for prevention and cure, was taken from brucella-free swine, convalescent at least 15 days. Blood from several animals was mixed, citrated, and given subcutaneously in doses of 50-100 ml., repeated if necessary at two-day intervals.—I. W. JENNINGS.

GOEBEL, W. F., OLITSKY, P. K., & SAENZ, A. C. (1948.) **The inactivation of biologically active proteins, and the virus of Western equine encephalomyelitis by periodic acid.**—*J. exp. Med.* 87. 445-455. [Authors' summary copied *verbatim*.] 1805

The action of periodic acid on two biologically active proteins, crystalline ribonuclease and pneumococcus Type III immune globulin, and on the virus of Western equine encephalomyelitis has been studied. The biological activity of the two proteins and the pathogenic action of the virus were destroyed by the reagent; the specific antigenicity of the immune globulin was retained, however, but that of the equine virus was lost. The bearing of these reactions on the chemical alteration of the respective substances has been discussed.

KOPROWSKI, H., RICHMOND, G., & MOORE, D. H. (1947.) **Electrophoretic study of antiviral sera.**—*J. exp. Med.* 85. 515-530. [Authors' summary copied *verbatim*.] 1806

Sera of animals immunized against Japanese B encephalitis, Venezuelan equine encephalomyelitis, and Western equine encephalomyelitis viruses were fractionated by electrophoresis. Electrophoretic patterns of rabbit sera before and after immunization against Japanese B virus showed no consistent change traceable to antibody formation. To determine the antibody content, the electrophoretic fractions of the respective sera were mixed in varying dilutions with infected mouse brain suspensions, and the neutralizing titers of the fractions were compared. In all instances serum fractions containing γ -globulin were protective, whereas in no case did serum albumin show any virus-neutralizing activity. The Japanese B encephalitis antibody appeared to

be associated entirely with the γ -globulin. The Venezuelan and Western equine encephalomyelitis antibodies were associated with the β - and γ -globulins and probably possessed an average electrophoretic mobility between that of β - and γ -globulins. Normal rabbit serum similarly separated electrophoretically showed no neutralizing properties. Chickens, whose electrophoretic serum pattern is markedly different from that of rabbits, were also immunized against the Japanese B encephalitis virus. Their antisera were electrophoretically fractionated and similarly subjected to neutralization tests. The specific neutralizing capacity of chicken serum was considerably lower than that of rabbit serum and no neutralizing activity was found in the fractions containing the faster moving components. The antibody appeared to be associated with component 4 which had a mobility of approximately 2.8×10^5 cm.²/volt/sec.

GUALANDI, G. (1946.) Della polmonite fibrinosa a grandi focolai o polmonite influenzale del cavallo. Osservazione e rilievi di ordine clinico. [Fibrinous pneumonia or influenzal pneumonia in horses].—*Zooprofilassi*. 1. No. 5. pp. 2-8; & 4-11. 1807

G. gives a detailed clinical picture of 31 cases of pneumonia of fundamentally the same type, observed over a period of two years. After a description of the diagnostic features, the differential diagnosis between influenzal broncho-pneumonia on the one hand, and lobar pneumonia, catarrhal broncho-pneumonia, pleurisy, primitive pleural pneumonia and secondary pleuritic complications on the other, he traces the clinical course, the complications and the prognosis of the disease. A second group of six horses with the same type of pneumonia was treated with neosalvarsan, which produced very favourable results.

The author goes on to deal with the relations between contagious broncho-pneumonia, lobar pneumonia and pectoral influenza as well as those between the latter and fibrinous focal broncho-pneumonia.

He concludes that the difference between lobar pneumonia and "contagious" pneumonia in the horse lies not only in the fact that the latter is contagious, but finds expression in the clinical picture and in the selective response to neosalvarsan. The latter disease is probably the simplest and most benign form of equine pectoral influenza.

—G. P. MARSHALL.

AMARASINGHE, D. W. (1948.) "The immunology and epidemiology of some virus diseases". [Correspondence].—*Vet. Rec.* 60. 144. 1808

Goat-adapted rinderpest virus from Kabete and from India was used to vaccinate cattle in

Ceylon. Spread of infection by contact of vaccinated cattle with healthy cattle, buffaloes or goats was not observed.

Cure of rinderpest is said to have been obtained by intramuscular injection of blood drawn from cattle at the height of the disease. This result, it is said, was obtained only in naturally infected cases; it could not be obtained in animals artificially infected by inoculation. [This peculiar finding is claimed to be similar to that obtained by Green in distemper by the use of ferret-adapted virus. In Green's case, however, an attenuated virus was used while A.'s observations were presumably on virulent bovine rinderpest.]

It is also stated that mild strains of Newcastle disease virus have been recognized in Ceylon producing symptoms resembling those of infectious bronchitis and coryza.—M. C.

HADDOW, J. R., & IDNANI, J. A. (1947.) The vaccination of highly susceptible animals against rinderpest.—*Indian J. Vet. Sci.* 17. 1-10. 1809

Results of vaccination against rinderpest in goats with alumina-gel and formolized tissue vaccines; in goats and hill bulls with glycerolized vaccines and in hill bulls, buffaloes and goats with lapinized virus are recorded.

Goats vaccinated with alumina-gel vaccine were strongly immune. Because of the difficulty in the preparation of the gel it was not found suitable for use under field conditions. Formolized tissue vaccine was found to be of no use in these animals.

Using a highly virulent strain of rinderpest virus, a vaccine consisting of two parts by weight of 60% glycerin to one part of spleen tissue incubated for 24 hours at 37°C. was found to be safe in goats and bulls, but the resulting immunity was inconsistent. Vaccines were prepared on the above lines, using a less virulent rinderpest spleen tissue virus and aging it at 37°C. for periods varying from 24-48 hours. It was found that aging at 37°C. for 30 hours gave a satisfactory vaccine in doses of 30 ml. for hill bulls and 15 ml. for sheep and goats. Immunity was tested up to 12 months.

In view of the cost and difficulties in manufacturing on the above methods a vaccine for highly susceptible animals, the authors evolved a suitable vaccine by adapting a highly virulent rinderpest virus in rabbits. Attempts to adapt strains of lesser virulence were unsuccessful. Using the virulent virus, attenuation was observed at the 55th passage as evidenced by the reaction in hill bulls. Up to the 154th passage this strain of virus was found useful as a vaccinating agent for cattle, buffaloes and goats. Except for slight thermal

reaction no systemic disturbance or fall in milk yield was noticed. It is reported that the rabbit adapted tissue virus is very fragile. The virus donor rabbits could be readily transported to areas within the range of a seven-day journey and used for vaccinating animals.—C. SEETHARAMAN.

SHOSHAN, A., & LANDAU, M. (1947.) Some observations on bovine malignant catarrh in Palestine.—*Vet. Rec.* 59. 463. 1810

Cases diagnosed as malignant catarrh are described from the Jerusalem area in cross-bred Friesian-local cattle. The affected animals were kept indoors in a primitive type of dark byre without ventilation. The disease occurred only in autumn and winter. The diet contained no greenstuffs.

The affected animals were all females and varied in age from 1-6 years. Of seven cases of which details were available, two recovered, one died and four were slaughtered as unlikely to recover. The animal that died was ill for seven days: in the others the period of illness was 5-43 days.

The symptoms were those typical of the head and eye form of malignant catarrh with, in addition, skin lesions. These latter, in two animals, consisted of peculiar corrugations, most marked on the neck, and, in a third, of urticaria-like eruptions all over the body, but most prominent on the udder and perineum. Nervous symptoms were seen in only one case. The superficial lymph nodes were enlarged to greater or less degree in almost all the affected cows.

P.M. lesions included congestion of the brain, laryngitis, pharyngitis and tracheitis. No histopathological examinations are reported.—J. R. H.

VAN DEN ENDE, M., DON, P., KIPPS, A., & ALEXANDER, R. (1948.) Isolation in chick embryos of a filtrable agent possibly related etiologically to lumpy skin disease of cattle. [Correspondence].—*Nature, Lond.* 161. 526. 1811

Emulsions from skin nodules and lymph nodes excised under local anaesthesia or taken after death from cases of lumpy skin disease [*V. B.* 16. 222] were treated with antibiotics or filtered through Gradocol membranes and inoculated into laboratory animals and chick embryos. It was not possible to establish infection in any of the laboratory animals used. A strain of virus was isolated by inoculating nine-day-old chick embryos by the combined amniotic and chorioallantoic routes and serial passage was maintained for more than a year.

The lesions in the chick embryos are constant, the embryos being shrivelled and tightly rolled up in a dry thickened amniotic membrane. Feather

development is usually absent and the chorio-allantoic membrane has gross gelatinous oedema. Inclusion bodies are numerous. Neutralization experiments in eggs using serum from recovered cattle and from cattle which have received repeated injections of egg-passaged virus have been successful. Positive results were also obtained on some occasions with serum from apparently normal cattle. One sample of serum from a convalescent bovine animal contained no demonstrable antibody.

It was not possible to set up the disease in healthy cattle by inoculation with egg-passaged virus.—M. C.

DONATIEN, A., PLANTUREUX, E., RAMPON, L., & GAYOT, G. (1946.) L'immunisation contre la peste porcine par séro-inoculation. [Serum inoculation against swine fever.]—*Rev. Méd. vét. Lyon et Toulouse*. 97. 210–214. 1812

This is an expansion of previous accounts by these authors of the evidence in support of their claims that the serum and virus prepared at the Pasteur Institute in Algiers can be used efficaciously in the control of swine fever in Metropolitan France. A description is given of the method of preparation of the immunizing agents and the rules of hygiene necessary to ensure its satisfactory administration.—J. A. J. VENN.

D'APICE, M., PENHA, A. M., & CURY, R. (1946.) Vacinação contra a peste suína, com vacina de cristal violeta, por via intra-dermica. [Intra-dermal vaccination with crystal violet swine fever vaccine.]—*Bol. Soc. paul. Med. vet.* 7. 262–267. [English summary.] 1813

In a search for a more efficient swine fever crystal violet vaccine, the authors found that the best formula of three which they tested was that containing 400 ml. defibrinated blood, 100 ml. glycerin, 40 ml. water, 0.6 ml. phenol and 60 ml. of 0.57 crystal violet solution. The vaccine preserved its activity for seven days at 37°C., and when given intramuscularly in doses of 1, 2, or 3 ml., protected swine against 2 ml. of virus given 21 days later. Intradermal inoculation of 1 ml. of the vaccine gave equal protection. For both routes of inoculation the immunity required 10–15 days to develop.—I. W. JENNINGS.

I. GEIGER, W. (1947.) Schweinepest und Schweinelähmung in Mitteleuropa z. Zt. des 2. Weltkrieges. [Swine fever and Teschen disease in central Europe at the time of the second world war.]—*Dtsch. tierärztl. Wschr.* 54. 33–40. 1814

II. SCHÖNBORN. (1947.) Schweinepest und Schweinelähmung in Mitteleuropa z. Zt. des 2. Weltkrieges. [Swine fever and Teschen disease in central Europe at the time of the second

world war. Remarks on W. Geiger's article. (*Dtsch. tierärztl. Wschr.* 54. 33).] — *Ibid.* 191. 1815

I. G. describes from the literature and from his own experience the development of the control of swine fever and Teschen disease in North-West Germany during the recent war and gives a statistical survey of the spread of the two diseases.

Results in Germany with a vaccine for swine fever from the Eystrup Institute and those obtained with simultaneous inoculation in other central European countries are described.

II. S. discusses G.'s work, but gives no new information.—E. G.

ZUBAJ, J. (1945.) Verbreitung und Bekämpfung der ansteckenden Schweinelähmung (Meningo-Polioencephalomyelitis enzootica suum) in der Slowakei (1945). [Spread and control of porcine encephalomyelitis in Czechoslovakia (1945).]—*Inaug. Dis. Bratislava*. [Abst. in *Wien. tierärztl. Mschr.* 34. 390–391. (1947).] 1816

A review, the abstract of which does not indicate that it contains any new information.

—A. L. WILSON.

GLÄSSER & EBEL. (1948.) Über eine in Verbindung mit einem Katarrh der oberen Luftwege aufgetretene ansteckende Encephalomyelitis lymphozytaria in einem Schweinebestande. [Lymphocytic encephalomyelitis in swine associated with catarrh of the upper respiratory tract.]—*Mh. Vet.-Med.* 3. 188–191. 1817

An outbreak of disease occurred in a herd of 16 pigs housed in a large brick building which was very cold.

The early symptoms were nasal catarrh and coughing, later there was loss of appetite, weakness and recumbency. One pig had complete paralysis of the left side. The duration of illness was from 6–14 days and the mortality 50%. Fever was present in the early stages, but in the terminal stages the temperature was normal or subnormal.

P.M. there was marked reddening of the nasal mucous membranes with abundant mucous discharge. There were early pneumonic lesions in the main lobes of the lungs. The liver was pale and the interlobular septae very well marked. In the kidneys greyish white nodules, the size of a pea, surrounded by a haemorrhagic zone were present in the medulla. There was hyperaemia and oedema of the meninges of the brain and cord.

The histological appearance of the brain and cord are described in detail and illustrated by photomicrographs. These brain and cord lesions very closely resembled those of Teschen disease.

On bacteriological examination a few Gram-positive diplococci were cultivated from the

kidney. These were not pathogenic for white mice and g. pigs and were thought to be secondary invaders. Two white mice inoculated subcutaneously with kidney tissue died.

Transmission experiments with pigs were not made. The outbreak was an isolated one and occurred in an area where no other outbreaks of Teschen disease were known. This area is over 600 miles from the nearest Teschen disease infected area.

Although the microscopical findings in the central nervous system so closely resembled Teschen disease, the other features, namely the marked nasal catarrh, the pulmonary and kidney lesions and the fact that only one of the pigs had definite paralysis, are not in accordance with a diagnosis of Teschen disease.

The authors suggest that this outbreak is an example of infection with a neurotropic strain of swine influenza virus and go further and suggest that Teschen disease virus is more likely to be a neurotropic variant of swine influenza virus than a completely new disease.—M. C.

HYAM, R. I. C. (1949.) **Canine encephalitis.**—*Vet. Rec.* 61. 78-79. 1818

Describes the symptoms and macroscopic P.M. findings of two outbreaks of disease in 1948 in British army dogs in Germany. The first occurred in dogs immunized against distemper and no definite diagnosis could be made. The second was diagnosed as "Hard pad" disease. (Neuropathological examinations were not made.)

—J. SCARNELL.

MACINTYRE, A. B., TREVAN, D. J., & MONTGOMERIE, R. F. (1948.) **Observations on canine encephalitis.**—*Vet. Rec.* 60. 635-642. Discussion pp. 642-648. 1819

This paper is a notable contribution to the complex problem of canine encephalitis. Hitherto publications have either been clinical, pathological without experimentation, or have dealt with experimental work around which there might be some dubiety regarding the results because of the question of the nature of the "infectious agent" used. The paper is an admirable combination of all these aspects and illustrates how in reality there has been superficial acceptance of the traditional belief that distemper may produce an encephalitic syndrome. The authors' observations include:—(a) that the distemper virus causes at the most neuronal damage and has no strict neurotropic properties; (b) a description of "Hard pad" disease, associated with a febrile illness, hyperkeratosis of the pads of the feet and a demyelinating form of encephalitis quite like that which has been so often described in dogs; the virus responsible can be transmitted to ferrets

in which the incubation period is much longer than in distemper infection, but it produces only a febrile reaction in experimental dogs; "Hard pad" disease can occur in dogs immunized against distemper; (c) a description of another form of demyelinating encephalopathy in dogs in which the infectious agent cannot be transmitted to ferrets or dogs; (d) a description of a form of perivascular lymphocytic encephalitis in old dogs without demyelination and with no damage to nerve cells; this "infection" could not be transmitted to ferrets or other dogs; (e) a brief reference to toxoplasma infection of the central nervous system and nutritional nervous diseases in dogs. The lesions are admirably illustrated.

In the discussion Pugh reviewed the pathological findings in disseminated encephalomyelitis described by PERDRAU & PUGH (1930) when demyelination in the dog was stressed for the first time in England. MacIntyre, Parry and Weipers all raised some very pertinent remarks on the clinical aspects. W. thought there might be some antigenic relationship between the Dunkin-Laidlaw virus and that of "Hard pad" disease and pointed out that in his experience dogs immune to distemper as a result of initial contact with "street distemper" did not contract "Hard pad" disease on exposure to infection. Hewetson reviewed his lengthy clinical experience with canine encephalitis and indicated that it is difficult to know, on clinical grounds alone, with what neurological entity one is dealing. Montgomerie in his reply mentioned how some "breakdown" of the Dunkin-Laidlaw virus immunization might be due to dogs harbouring at the time the "Hard pad" virus and cited some experimental evidence in support of this. There was no contention made that "Hard pad" disease was a new disease. He did not agree that there was a relation between the distemper and "Hard pad" virus in the same sense of cow-pox and small-pox in which there was complete cross immunity. There are obviously a number of virus infections which have existed in dogs and which have been confused on clinical grounds; the pathology of each requires almost a complete re-investigation [see also RUBARTH [*V. B.* 18. 369].—J. R. M. INNES.

INNES, J. R. M. (1949.) **The relation of distemper infection to the aetiology of canine encephalopathies.**—*Vet. Rec.* 61. 79-77. 1820

The author describes the confusion in the pathology of canine encephalopathies in the past and refutes the loose acceptance of the distemper encephalitis picture on clinical grounds alone. He discusses his own work on nervous disorders in the dog and with the fox encephalitis virus. His summary of the findings of recent workers ends with the work of MACINTYRE *et al.* [see pre-

ceding abst.] and draws attention to the importance of their association of a specific virus with a demyelination lesion.—J. SCARNELL.

VERLINDE, J. D. (1948.) *Opmerkingen over de vormen van encephalitis bij de hond. [Forms of encephalitis in dogs.]—Tijdschr. Diergeneesk.* 73. 922-932. [Abst. from English summary.] 1821

The statement on canine encephalitis presented by MACINTYRE *et al.* [see abst. 1819] is discussed.

According to the statement the neurological signs in the course of, or immediately following on apparent recovery from distemper, are not due to a true encephalitis but to necrosis of nerve cells. In V.'s own investigations this became evident, especially in puppies that had died in the acute stage of distemper, and in older dogs with sequelae like chorea and epileptic attacks. In the former there was acute necrosis of nerve cells and in the latter there were glial-sclerotic foci in the cortex. Apparently the distemper virus does not possess real neurotropic properties, as it can be detected in the central nervous system of dogs without any sign of encephalopathy. It has been demonstrated independently by the English investigators and by V. that intracerebral inoculation of the distemper virus does not result in encephalitis but merely in acute distemper without neurological symptoms. In V.'s opinion, however, a demyelinating encephalitis may develop after the acute phase of distemper. This form of encephalitis could be produced in dogs infected with distemper virus and repeatedly injected with sublethal doses of guanidine or bacteria-free filtrates of putrefying meat or of the intestinal contents of a dog suffering from haemorrhagic gastro-enteritis. The filtrates themselves were unable to produce encephalitis. Perhaps the demyelinating distemper encephalitis may only develop when the virus invades a field that has been modified by endogenous, or exogenous (drugs) toxic materials. A demyelinating encephalitis similar to the former develops in the course of a disease which in certain respects differs from distemper and is perhaps identical with the so-called hard pad disease. The causative virus, isolated by the author in 1943-44, proved to be immunologically different from, but related to, the original distemper virus. It has been considered as a variant of the true distemper virus (type A) and has been called type B. Probably the type B virus is identical with the hard pad virus.

Moreover, the statement mentions a demyelinating encephalitis of unknown aetiology and a non-demyelinating encephalitis. The latter might be identical with the so-called idiopathic encephalitis described by V. in 1939 [*V. B.* 12. 151].

Finally, the essential characteristics of both the demyelinating and the idiopathic encephalitis are reviewed, the former being a leucoencephalitis, the latter a polioencephalitis.

DUNLAP, G. L. (1948.) *Canine distemper vaccine of epithelial origin.—N. Amer. Vet.* 29. 653-654. 1822

In view of the frequency with which the distemper virus attacks epithelial tissues the author has prepared a formolized thirty-three and one-third *per cent.* suspension of trachea, lung, stomach, kidney, gall bladder and urinary bladder tissue from affected dogs. Twenty dogs aged from three months to one year were injected intradermally with 1 ml. of the supernatant fluid from the above suspension. A second dose was given one week later and one to two weeks after the second dose the vaccinated dogs, together with 16 unvaccinated controls, were exposed to natural infection.

All the controls died of distemper whilst three of the vaccinated group developed a mild attack and recovered without treatment.—E. J. H. FORD.

YOUNG, M. G. D., & HYAM, R. I. C. (1949.) *Report on an outbreak of hard pad disease in B.A.O.R.—J. R. Army vet. Cps.* 20. 24-29. 1823

The authors encountered an outbreak of "Hard pad" disease in breeding kennels containing 68 dogs.

All of 23 dogs previously inoculated against distemper were affected and six recovered. Twelve out of 17 uninoculated dogs were affected and one recovered. Two out of 28 unweaned pups were affected and neither recovered. All cases occurred in dogs under six months of age. Diagnosis was based on symptomology and gross P.M. examination, also on bacteriological examination in two cases. No histological findings or transmission experiments are reported. Cases ranged from a peracute type with collapse, blood stained anal discharge and death, to sub-acute and chronic cases with serous oculo-nasal discharge and fluctuating temperature, followed within ten days by hardening of the pads and eight days later by convulsions and chorea. Hardening of the pads was seen in 20% of cases. A wide range of drugs was used with little effect, although the authors feel that liver extract and vitamin B injections may have helped two cases.

—E. J. H. FORD.
ORMROD, A. N. (1949.) *Hard pad disease.—Vet. Rec.* 61. 79-80. 1824

O. gives his observations on "Hard pad" disease as seen in his practice in Cheshire during the last few years. Successful treatment with pyridoxine is reported in early cases.—J. SCARNELL.

CHADDOCK, T. T. (1948.) Infectious canine hepatitis as it occurs in the dog experimentally.

—*Auburn Vet.* 5. 11-12. 1925

This is a concise review based on original work with both the natural and experimental disease in foxes, dogs and other carnivora. It emphasizes very clearly, now that more is known about the pathology, how the disease in the U.S.A. is becoming recognized with ever increasing frequency. It seems fairly evident that the fox encephalitis infection (Green), and hepatitis contagiosa canis (Rubarth), whether present in dogs or foxes, represent the same virus disease entity and that it must have been confused with distemper for many years.

The virus of fox encephalitis and its transmissibility to dogs was identified by Green who insisted, in the face of opposition, that this virus infection was quite distinct from distemper. It has occurred very commonly in epizootic form in foxes in captivity; there are some differences in the symptoms when the infection is transmitted to dogs. In the former there is an abrupt onset with an incubation period of 2-6 days with sudden development of signs referable to the nervous system.

As far as the pathology of the disease is concerned, it is a general virus infection which causes particular damage to vascular endothelium. The disease can be controlled by formolized tissue vaccine and serum.

Experimentally, young dogs are more susceptible than old ones. Most animals seem to recover after a fever, lasting 5-10 days, with purulent discharge from the eyes. In the remainder, nervous symptoms nearly always develop and the dogs die within ten days. The pathological findings include oedema of the lungs, various haemorrhagic manifestations, and oedematous inflammation of the gall bladder. For diagnostic purposes C. prefers to inoculate brain and liver tissue intra-ocularly into young dogs; this causes corneal opacity and inclusion bodies can be identified in the epithelium of the anterior chamber of the eyes. This is regarded as a more certain and speedy technique than that of pathological examination of tissues. [It is questionable whether or not equally good and rapid results could not be obtained by rigorous pathological examination of tissues by use of frozen sections and which would eliminate the need to use experimental puppies.]

The increased attention which is being given to this disease in the U.S.A. indicates the necessity for comparable work in Britain.—J. R. M. INNES.

BRION, A., & BERTRAND, M. (1947.) Les maladies infectieuses du chat. [Infectious

diseases of the cat.]—*Encyclopéd. vét. périod.* 4. 123-138. 1826

This is a summary of the knowledge, to date, of feline distemper, feline gastro-enteritis and feline pan-leucopenia. Feline distemper appears to be comparatively rare in France, but the other two diseases are widespread, and the authors recommend preventive vaccination, preferably with a bivalent vaccine, to control the great annual outbreaks in the large towns.—I. W. JENNINGS.

BANG, F. B. (1948.) Studies on Newcastle disease virus. I. An evaluation of the method of titration. II. Behavior of the virus in the embryo. III. Characters of the virus itself with particular reference to electron microscopy. —*J. exp. Med.* 88. 233-240; 241-249; & 251-266. [Author's summaries copied verbatim.] 1827

I. The application of the 50 per cent embryo mortality to a study of the virus of Newcastle disease is described. It has been evaluated by a series of duplicate titrations of the same sample of virus. In seven such titrations the largest difference between the two was $10^{-0.4}$. It is therefore believed that a difference of 0.6 log is probably significant and of 1.0 log almost certainly significant. This would mean that we can almost certainly detect a loss of 90 per cent of activity.

Neither temperature of incubation nor route of inoculation in the test embryos had consistent effect on the measurement of virus activity. The effect of increasing age of the incubated embryo, from 10 days up to 16 days, is slight and inconsistent. The addition of chicken red blood cells to a dilution of virus may lower the titer of the preparation, but the change is not sufficient to be of importance in the routine handling of the virus.

II. The virus of Newcastle disease of chickens resembles those of the encephalitis group in its ability to spread throughout the developing egg and embryo, but it is similar to influenza virus in the high concentration of it found in the allantoic fluid before death. No effect of the size of the inoculum on the final titer of virus in the allantoic fluid was detected. Good growth occurred at temperatures from 35° to 41°C., apparently more rapid at 40°C. than at 35°C. No appreciable development of virus capable of agglutinating red cells but of low embryo infectivity was found. Although virus multiplication was not immediately perceptible after inoculation, this cannot on present evidence be attributed to a real lag phase.

III. It is likely that certain tailed and filamentous particles seen on electron microscope examination of partially purified saline suspensions

of Newcastle virus are the individual virus particles because: (a) They have a highly characteristic shape not seen in other virus preparations. (b) They are present whenever the virus is present in high concentration. (c) Their size agrees with the size of the virus as calculated from light scattering and centrifuge data. (d) They are agglutinated by specific antisera. (e) Infection may be produced in the embryo by relatively few of these particles.

It is possible that these filamentous forms have been derived from spherical forms without loss of activity because: (a) Such filamentous forms are not found in the original allantoic fluid when this contains a comparable amount of virus. (b) Filamentous forms appeared in the original allantoic fluid when it was dialyzed against saline solution. (c) Filamentous forms were produced at certain hydrogen ion concentrations but not at others, in solutions maintaining the same infectivity for the embryo. (d) Spherical forms were obtained by suspending the partially purified virus in water instead of saline. In this the virus remained moderately stable. (e) These round forms could apparently be converted into tailed and filamentous forms by the addition of saline, again without loss of activity. (f) This "conversion" could be inhibited by partial inactivation of the water suspension of virus.

REAGAN, R. L., LILLIE, M. G., HAUSER, J. E., & BRUECKNER, A. L. (1948.) **Electron micrographs of the hamster-adapted Newcastle virus.**—*Cornell Vet.* 38. 418-420. [Authors' summary copied *verbatim*.] 1828

After the 200th intracerebral passage of the California strain of Newcastle virus in Syrian hamsters, electronscope micrography revealed no change in the morphology of the virus. As described earlier by BANG [*V.B.* 19. 16], this virus appears filamentous or stringy in form with a large head and a tapering tail form.

SHIRLAW, J. F., & SANKARANARAYAN, N. S. (1947.) **Conjunctivitis of sheep and goats in India.**—*Indian J. Vet. Sci.* 17. 69-73. 1829

A sporadic disease of sheep and goats clinically comparable with rickettsial conjunctivitis has been described. The bodies seen in the cells of the conjunctival epithelium of the goat and sheep resembled *R. conjunctivae* of Cole (1931) in morphology and staining characters. The authors examined conjunctival films of both affected and healthy sheep, goats and cattle and saw the same organisms in almost every case. They could not transmit the disease to healthy goats and sheep by application of ocular discharges into the eyes of the healthy ones. Contact experiments also failed to reproduce the disease.—S. K. CHAUDHRI.

PERRIN, T. L. (1949.) **Histopathologic observations in a fatal case of Q fever.**—*Arch. Path.* 47. 361-365. [Author's summary copied *verbatim*.] 1830

The sixth recorded fatal human case of Q fever is that of a 43 year old man who died after an influenza-like illness lasting fifteen days. Significant lesions encountered on histopathologic examination included bronchopneumonia characterized by a predominantly mononuclear cell exudate, focal hypoplasia of the bone marrow with a moderate left shift of cells of the granulocytic series, and moderate to marked coronary arteriosclerosis with an old, organized myocardial infarct. When the lesions were compared with those reported in other fatal human cases and with experimental infections it appeared that the bronchopneumonia and the lesions of the marrow may have been due to the infectious agent of Q fever. It is suggested that the cardiac condition may have exerted an unfavorable influence on the course of the disease.

HUEBNER, R. J., HOTTE, G. A., & ROBINSON, E. B. (1948.) **Action of streptomycin in experimental infection with Q fever.**—*Publ. Hlth Rep., Wash.* 63. 357-362. [Authors' summary copied *verbatim*.] 1831

Crystalline streptomycin, in doses as low as 0.5 miligram, was found to exercise a rickettsiostatic action on the growth of *R. burneti* in the yolk sacs of fertile eggs. Although there was no evidence of rickettsiocidal action with doses as high as 10 mg. per egg, inhibition of growth was greater with the higher doses. Guinea pigs inoculated with highly virulent yolk sac suspensions of *R. burneti* showed a low mortality rate when treated with 30 mg. of streptomycin given three to six times daily by the subcutaneous route.

The amounts of streptomycin per kilogram of body weight which were used in the guinea pig experiments were comparable to dosages recommended for treatment of streptomycin-susceptible diseases in man. Treatment of the guinea pigs was initiated at a much earlier stage than could be achieved in human infection with Q fever. However, the infectious doses administered to the guinea pigs were overwhelmingly large and the primary objective of the experiments was to observe the action of streptomycin in preventing death of guinea pigs infected with Q fever.

ZEWI, M. (1948.) **Rubeola under graviditet och kongenitala missbildningar hos barnet. [Rubella in pregnancy and congenital deformities in the child.]**—*Nord. Med.* 37. 416-418. [English summary copied *verbatim*.] 1832

Following observations made by GREGG in 1941 on the occurrence in Australia of multiple

congenital deformities in infants whose mothers had been afflicted with rubella (German measles) during their pregnancy, similar cases have been reported from various quarters. ZEWE describes two cases in Finland.

One of the infants had double-sided congenital hydrophthalmus and clouded corneas. The infant's mother had suffered from rubella during the second month of her pregnancy.

The second infant had double-sided congenital cataract and microphthalmia. The infant's mother had suffered from rubella during her first month of pregnancy.

The weight of both infants at birth was low, there was a difficulty in rearing them, they were backward both physically and mentally, and they showed signs of congenital heart disease.

GRÖNVALL, H., & SELANDER, P. (1948.) Några virusjukdomar under graviditet och deras verkan på fostret. [Some virus diseases during pregnancy and their effect on the foetus.]—*Nord. Med.* 37, 409–415. [English summary copied *verbatim*.] 1833

Gregg discovered in 1941 that maternal rubella (German measles) may cause malformations in the child. The present authors have studied the conditions in this respect in Sweden as well as whether certain other virus diseases in the mother have any effect on the fetus. Pregnant women, mainly such attended at lying-in-hospitals, have been thoroughly questioned as to whether and when they have had a virus disease during their actual pregnancy. Any abortions reported have been recorded and the children after-examined. The results are as follows:

Of 26 women with *rubella*, 2 aborted, while 1 malformed and 25 non-malformed children were born.

Of 20 women with *measles*, 3 aborted, while 17 healthy children were born.

Of 11 women with *varicella*, 1 gave birth to a dead child (twin), while 12 healthy children were born.

Of 34 women with *parotitis epidemica*, 1 aborted, while 5 malformed and 28 healthy children were born.

Of 29 women with *hepatitis acuta*, 2 aborted. There were 4 premature births, none of these children was malformed, but 2 of them died. One child was malformed, 26 were not.

Of 38 women with *poliomyelitis acuta anterior*, 8 aborted. In one case the child died during delivery. Two children were born prematurely and soon died. Two children had cardiac defect, 26 were not malformed.

18 women with *scarlet fever*, all gave birth to healthy children.

The calculated frequency of the virus diseases

dealt with in this material of pregnant women is 0.47 per cent.

A study has also been made of the occurrence of some virus diseases during pregnancy in mothers of physically or psychically gravely defective children and has given the following results:

Among 354 mothers of defective children *rubella* occurred 4, possibly 5, times, *measles* occurred once, *varicella* once, *parotitis epidemica* 5 times, *hepatitis acuta* at least 3 times, and *poliomyelitis acuta anterior* at least twice.

In this material the frequency of these virus diseases in mothers of defective children was about 5 per cent. Virus diseases here in question are accordingly met with ten times more often in mothers of malformed children than in our material of pregnant women attended at lying-in-hospitals.

HENLE, G., HENLE, W., WENDELL, K. K., & ROSENBERG, P. (1948.) Isolation of mumps virus from human beings with induced apparent or inapparent infections.—*J. exp. Med.* 88, 223–232. [Authors' summary copied *verbatim*.] 1834

Exposure of fifteen children to mumps virus of fifth amniotic passage in chick embryos led to involvement of the salivary glands in six, orchitis in the absence of other manifestations of mumps in one, and to no signs of illness in eight. Attempts to isolate virus from the saliva of these individuals gave the following results:

1. All patients with involvement of the salivary glands excreted virus beginning on the 11th to 15th day after exposure, 2 to 6 days prior to onset of clinical signs of disease and extending up to the 4th day of illness.
2. The patient with primary orchitis without any recognized involvement of the salivary glands excreted virus for 2 days, beginning on the 15th day after exposure and 10 days prior to his illness.
3. Six of the eight children classified as having inapparent infections because of their serologic response in the absence of clinical signs of illness, began to excrete virus on the 15th to 16th day after exposure for from 1 to 9 or more days.

The epidemiologic significance of these data is discussed.

SFORZA, M., & SOLINAS, N. (1947.) La reazione di Weil-Felix sul siero di sangue dei cani di Asmara. [The Weil-Felix reaction in the serum of Eritrean dogs.]—*Bol. Soc. ital. Med. ig. trop. sez., Eritrea*. 7, 475–482. 1835

The authors carried out the Weil-Felix test on the sera of 159 dogs in Asmara. Suspensions of *Proteus* OX 19 and OX 2 were used. As no criteria for the test in dogs are laid down, results

were estimated by analogy with the test in man, and titres of 1:320 and over were regarded as positive. Fourteen animals had titres of 1:320 or over [here the text differs from the table, which gives only 12 positive results] and are regarded by

See also absts. 1913 (lumpy skin disease); 2018 (in U.S.A.).

IMMUNITY

HOLE, N. H., & COOMBS, R. R. A. (1947.) **The conglutination phenomenon. I. An introduction to the conglutination phenomenon and an account of the observations and views of previous investigators. II. The technique of the conglutinating complement absorption test compared with the haemolytic complement fixation test.**—*J. Hyg., Camb.* 45: 480-489; & 490-496. *1947*

I. Conglutination is the name which was given by BORDET & STRENG (1909) to the property of bovine serum in clumping red cells which have been sensitized by an antibody and which have absorbed complement. The reaction differs from agglutination in requiring both complement and a heat-stable constituent of bovine serum called conglutinin. An immune body, too weak in itself to cause agglutination of red cells or bacteria, may therefore be enhanced by the addition of complement and conglutinin; this method of application is called the Direct Conglutination Reaction.

The complement absorbed best by an immune system may not be g. pig complement as used in the haemolytic complement fixation test. The serum of certain animals, such as horse, pig and cat, contains complement which is readily absorbed by sensitized cells, but the process does not usually result in haemolysis. "Non-haemolytic" complement from such sources may be employed in a diagnostic procedure based on the same principles as the ordinary haemolytic complement fixation test, but employing the conglutination reaction. This procedure is called the Conglutinating Complement Absorption Test and consists in mixing a non-haemolytic complement with the antigen-antibody system and, after a period, adding sheep's cells, an antibody to sheep's cells and conglutinin (a conglutinating system) to test for free complement.

The authors review the literature from the original observations of EHRLICH & SACHS (1902) and BORDET & GAY (1906) to the development by STRENG (1910) of a conglutinating complement absorption test. Then follows a critical account of the application of the reactions (both the direct and complement absorption tests) as diagnostic procedures and, finally, a review of papers having a direct bearing on the mechanism of the reaction and the nature of conglutinin. Attention is drawn

the authors as carriers of typhus. In all, 117 dogs had titres of 1:40 or over, when tested with strain OX 19, and 105 had titres of 1:40 or over with strain OX 2.—I. W. JENNINGS.

to papers on antibodies against complement. [A clear and complete review of a subject hitherto confused.]

II. The authors describe in detail their procedure for the haemolytic complement fixation test and the conglutinating complement absorption test. The unit volume is 0.4 ml., a total of five volumes being used. Small tubes measuring 5.5 × 0.8 cm. are used, which are centrifuged before reading to detect the tubes with partial haemolysis in the one test, and in the other because a re-suspension technique is used to assess clumping of the cells. The preparation and preservation of the reagents follow accepted practice; conglutinin is stored frozen.

The reagents are first subjected to a range titration and subsequently titrated in smaller steps in the region of the end-point so obtained, to secure an accurate titre. The minimal complementary dose [M.C.D.] of the haemolytic complement is the smallest quantity which causes visible haemolysis. Complete haemolysis is usually secured with 2 M.C.D. The titre of non-haemolytic complement is the smallest quantity which causes complete conglutination of the cells.

The sheep's cell haemolysin is titrated in the presence of 4 M.C.D. of complement and the end-point is determined by complete haemolysis. The bovine serum is the source not only of conglutinin, but also of an antibody against sheep's cells. The strengths of the two substances may vary independently and the method of standardization adopted is to titrate the bovine serum for both substances in one operation and thus to determine the "apparent minimal conglutinating dose" of the serum. Two or four of these doses are used.

The authors draw attention to the need for determining the optimal dilution of antigen. In the diagnostic test, the serum is serially diluted and the antigen and the appropriate complement (2 M.C.D.) are added. After standing for 30 min. at room temperature the haemolytic system (1% sheep's cells and haemolysin) or conglutinating system is added. The latter consists of sheep's cells (0.25%) and bovine serum which contains conglutinin and a natural antibody against sheep's cells.—G. FULTON ROBERTS.

WIENER, A. S., HURST, J. G., & SONN-GORDON, E. B. (1947.) **Studies on the conglutination**

reaction, with special reference to the nature of conglutinin.—*J. exp. Med.* 86. 267–284. 1937

Rhesus antibodies are of two kinds; the first will agglutinate the specific cells in saline, whereas the second combines with the appropriate cells in saline but does not agglutinate them. The latter, however, will agglutinate specifically in a medium of plasma, serum, concentrated albumin (bovine and human) [and gum acacia]. The authors studied the properties of the first three of these diluents in bringing about agglutination of Rhesus positive cells sensitized by a non-agglutinating form of Rh antibody.

They believe that plasma exerts this effect because of the presence of a relatively heat-stable component (possibly an aggregate of proteins similar to X-protein) which they call conglutinin. Plasma loses its conglutinating property when diluted to less than 40% of its initial concentration. Serum is slightly less active than plasma. Heating to 56°C. for 30 min. reduces the activity of plasma, but slightly enhances the activity of serum. There is no significant individual variation in plasma potency.

Foetal plasma and serum have a significantly reduced conglutinating power compared with adult samples. For this reason the authors suggest that whole blood transfusions to infants with erythroblastosis foetalis may, by supplying conglutinin to an infant naturally deficient therein, enable the antibody to exert a more powerfully adverse effect than before the transfusion. They therefore suggest replacing some of the donor's plasma with saline before transfusing.

By mixing plasma in varying proportions with 25% human, and 80% bovine albumin it was found that the mixtures had a greater conglutinating activity than either medium alone. The same was true of mixtures of γ -globulin with plasma. The optimal proportions were one part of albumin or globulin to three parts of plasma. Good results were also obtained with mixtures of albumin and globulin.

[The reaction described here as conglutination has no relation to the Conglutination phenomenon recently studied and reviewed by HOLE & COOMBS (see preceding abst.).—G. F. R.

HEIDELBERGER, M. (1947.) Complement: immunity intensifier, diagnostic drudge, chemical curiosity.—*Science in Progress*. Ser. 5. pp. 149–165. 1938

An account in simple terms of the properties of complement, with special reference to the chemical characteristics.

The quantitative investigations of antigen-antibody reactions by the estimation of protein nitrogen with micro-methods may be applied to

complement fixation. By these methods it is calculated that for immune haemolysis a sheep's red cell needs 25,000 molecules of complement and 500 molecules of antibody globulin. Having regard to the surface area of the red cell this implies that a complete "coating" with antibody in the physical sense is not necessary for haemolysis. The quantities involved also suggest that complement activity does not resemble enzyme action but that complement enters into chemical combination with antigen and antibody so that, in systems not involving the red cell, an immune aggregate is formed.

It has been found, by dialysis against water, and the action of heat, ammonia and yeast, that complement has four demonstrable components, all of which, however, are necessary for haemolytic activity. C'1 is destroyed by heat, and is precipitated by dialysis against water; C'2 is also thermolabile, but soluble after water dialysis. C'3 is thermostable but is the only fraction destroyed by the action of washed yeast cells on complement; it is also insoluble after water dialysis. C'4 is also thermostable, and water-soluble by dialysis; however, unlike other fractions it is inactivated by brief exposure to ammonia with subsequent neutralization.

The four fractions appear in varying concentrations in the serum of different mammalian species. C'3 is generally present in the weakest concentration and is therefore the determining factor of complementary activity of a serum. The g. pig has more active C'3 than other mammals. The quantitative activities of each fraction in haemolysis are only partly understood.—G. F. R. FREUND, J., THOMSON, K. J., HOUGH, H. B., SOMMER, H. E., & PISANI, T. M. (1948.) Antibody formation and sensitization with the aid of adjuvants.—*J. Immunol.* 60. 888–898. 1939

The antigen used in these experiments was *Salmonella typhi*, and agglutination was carried out with H suspensions at refrigerator temperature for 18 hours. Subcutaneous inoculation was employed on groups of 6–8 male rabbits weighing 3,000–4,000 g. The emulsifying agents studied were falba [a proprietary substance], lanolin, arlacel A [mannide mono-oleate], tween 80 [poly oxalkylene derivative of sorbitan mono-oleate], lecithin, beeswax and combinations of myricin with cholesterol and oleic acid. Paraffin oil or peanut oil was used for the oily phase of the emulsion. As adjuvants, lecithin, cholesterol, cerotic acid, killed mycobacteria and lipid extracts of mycobacteria were studied.

Antibody formation was enhanced and sustained when the injected antigen was incorporated in water-in-oil emulsions of paraffin oil with falba, anhydrous lanolin, arlacel A or a myricin-

cholesterol combination. Oil-in-water emulsions of paraffin oil in tween 80, or myricin-oleic acid combination were ineffective. Using emulsions with lecithin and paraffin oil the immune response was not well sustained. Peanut oil was not an effective substitute for paraffin oil.

Further enhancement was observed when killed mycobacteria, or lipid extracts thereof, or cholesterol, were added as adjuvants. Cerotic acid as an adjuvant retarded antibody formation.

The effect of some of these substances on the sensitization of g. pigs to picryl acid was also studied.—G. FULTON ROBERTS.

TRETHERWIE, E. R., & DAY, A. J. (1948.) **The influence of past experience on the liberation of histamine and its immunological significance.**—*Aust. J. exp. Biol. med. Sci.* 26. 923-338. 1840

The output of histamine from the isolated lung of the g. pig following the injection of trypsin was significantly greater in those animals which had previously received repeated subcutaneous injections of peptone.

The total content of histamine in the lungs was somewhat (but not significantly) higher in "peptone" than in control animals, and when the total content of histamine in the whole lung was estimated there was a significantly greater number of "peptone" animals in the upper half of the range than of control animals.

The significance of these findings, especially from the immunological standpoint, is discussed.—R. V. S. BAIN.

HECHTER, O., & SCULLY, E. L. (1947.) **Studies on spreading factors. II. The effect of serum upon hyaluronidase spreading activity.**—*J. exp. Med.* 86. 19-28. [Authors' summary copied *verbatim*.] 1841

The reaction between normal serum and hyaluronidase has been studied *in vitro* and under *in vivo* conditions in skin. Using *in vitro* conditions of incubation, serum exhibits anti-hyaluronidase activity as measured by assay of hyaluronidase spreading activity in skin. This confirms the work of others, who have previously described the serum inhibitory factor using other tests of hyaluronidase activity. When, however, hyaluronidase and serum are allowed to incubate in skin under *in vivo* conditions, no inhibitory influence of serum upon hyaluronidase spreading activity is evident. This latter finding has been taken to indicate that the environmental conditions in skin are unfavorable for the inhibitory reaction of serum upon hyaluronidase. The disparity between the *in vivo* and *in vitro* effectiveness of serum, and the significance of the serum factor as a defense mechanism against invasive processes, have been briefly discussed.

I. CROSS, F. W., & HOWELL, A., Jr. (1948.) **Studies of fungus antigens. II. Preliminary report on the isolation of an immunologically active polysaccharide from histoplasmin.**—*Publ. Hlth Rep., Wash.* 63. 179-183. 1842

II. HOWELL, A., Jr. (1948.) **Studies on fungus antigens. III. Sensitization of normal animals with skin test antigens.**—*Ibid.* 595-601. 1843

I. Since it had been found that g. pigs experimentally infected with *Histoplasma capsulatum* or *Blastomyces dermatitidis* would react to histoplasmin [*V. B.* 18. 302], an attempt was made to extract the specific reacting principle from histoplasmin. Protein fractions were extracted by precipitation with glacial acetic acid and the carbohydrate fraction by alcohol precipitation. A protein-free polysaccharide antigen was obtained, which gave reactions in g. pigs experimentally inoculated with *H. capsulatum* and *B. dermatitidis*: histoplasmin and blastomycin respectively were used as controls during the intradermal testing of the specific polysaccharide; 27 to 34 g. pigs were used for each dilution of the polysaccharide or control. The dosage of the fraction required to produce a reaction in infected g. pigs varied from 0.1 mg. to 0.01 mg., and, in general, more infected animals reacted to the polysaccharide fraction than to the original histoplasmin. It appeared that if the critical titre of the antigen were determined it would be relatively specific for animals infected with *Histoplasma capsulatum*.

II. The object of this section of the work was to determine the effects on normal g. pigs of repeated intradermal injections of concentrated dilutions of various fungus antigens, namely, histoplasmin, blastomycin, an autoclaved filtrate of *Candida (Monilia) albicans* (probably carbohydrate in nature), heat-killed suspensions of the yeast phase of *H. capsulatum* and *B. dermatitidis*, and a heat-killed suspension of *C. albicans*. Between 9 and 20 g. pigs were used for each dilution of each antigen tested: the intradermal tests were read at 24 hours, 5 mm. or more of induration constituting a positive reaction. It was found that, if used in sufficient concentrations, these antigens may sensitize normal g. pigs: the sensitization produced by the heat-killed cells of *C. albicans* was weaker than that produced by actual invasion of the tissues by living cells. There was evidence of a cross-reaction between *C. albicans* and histoplasmin.—CLIVE BRIGGS.

SASLAW, S., & CAMPBELL, C. C. (1949.) **A comparison between histoplasmin and blastomycin by the colloidal agglutination technique.**—*Publ. Hlth Rep., Wash.* 64. 290-294. [Authors' summary copied *verbatim*.] 1844
Colloidal particles sensitized with either histoplasmin or blastomycin were employed in

agglutination studies. Specific histoplasma rabbit sera strongly agglutinated collodion suspensions sensitized with histoplasmin and also reacted with blastomycin-treated particles to a lesser degree.

B. dermatitidis antisera reacted in low dilutions with blastomycin-coated particles and gave weaker or negative agglutination reactions when histoplasmin was used as antigen.

Rabbit sera prepared against *B. braziliensis*, *S. schenckii*, *C. neoformans*, and *C. albicans* as well as normal sera did not, as a rule, agglutinate collodion particles sensitized with either histoplasmin or blastomycin.

Six different lots of histoplasmin were compared and found applicable to the collodion agglutination test.

SABIN, A. B., & FELDMAN, H. A. (1948.) **Dyes as microchemical indicators of a new immunity phenomenon affecting a protozoon parasite (Toxoplasma).**—*Science*. 108. 660–668. 1845

Toxoplasma are stained by alkaline methylene blue and, in the presence of normal serum, have a characteristic morphology and staining reactions. In the presence of fresh specific immune serum, the organisms are distorted and the cytoplasm does not take up the stain. Intracellular toxoplasma, however, stain normally even in the presence of fresh immune serum. Toxoplasma killed by physical means also yield the staining reactions of the type seen when the organism is modified by immune serum, except that in the former the intracellular forms are also affected. The effect is best demonstrated after the organisms have been in the immune serum for one hour at 37°C. before staining. If the immune serum is heated the effect is no longer demonstrated. Heated immune serum, however, may be reactivated by fresh undiluted normal human serum but not by heated normal serum. Normal sera from the sheep, cow, horse, dog, monkey, rabbit, rat and g. pig may also exert the staining alteration effect seen with toxoplasma immune sera. The "accessory factor" in normal human serum does not appear to be complement, or the heat-labile fractions thereof. The immune serum appears to combine with toxoplasma in the absence of the "accessory factor" (though the staining alterations are not then observed), but the "accessory factor" does not combine with toxoplasma in the absence of the specific antiserum.

In addition to alkaline methylene blue, dyes of the thiazine, oxazine and amino-azine groups behave similarly. Phloxin, on the other hand, fails to stain normal toxoplasma, but stains those modified by specific antiserum.

The phenomenon is used to study immune sera produced artificially, or from cases of toxoplasmosis.—G. FULTON ROBERTS.

SMITH, E. L., & COY, N. H. (1946.) **The absorption spectra of immune proteins.**—*J. biol. Chem.* 164. 367–370. 1846

The absorption spectra of immune proteins from the horse, cow and human being were measured. The immune proteins were homogeneous by electrophoretic methods. Slight differences in the absorption spectra were related to the varying content of phenylalanine, tyrosine and tryptophane.—G. FULTON ROBERTS.

PUGET, E. (1948.) **Sur l'ictère des muletons nouveau-nés. [Jaundice of new-born mules.]**—*Rev. Méd. vét., Lyon et Toulouse*. 99. 503–510. 1847

A review of five monographs by Spanish authors on jaundiced mules. The Spanish workers show that the mare may have certain symptoms which are invariably followed in due course by the birth of an affected mule. Between the ninth and tenth month of gestation the mare quite suddenly appears to be about to go into labour. Equally suddenly, three or four days later the udder returns to its normal size and consistency and remains so until the birth of the mule. The same symptoms, but without the mammary changes, may be met with in other circumstances.

It is noted that the onset of jaundice, though usual shortly after birth, may be delayed for as much as six days. When icterus is delayed, the new-born mules may temporarily be excessively frisky. In some cases, at the time of birth a spleen-like mass, similar to a blood clot, is noticed in and around the muzzle of the affected mule. It is said that the more friable and lacerated is this mass, the worse is the prognosis.

Two main syndromes are experienced. In one asthenia, anaemia, icterus and haemoglobinuria are characteristic. In the other, chocolate-coloured urine is passed and the jaundice is more marked. Haemorrhagic disease of the new-born due to vitamin K deficiency, is considered in the differential diagnosis.

The opinions of the Spanish workers regarding pathogenesis are varied. An infective or parasitic cause is rejected. One worker favours a deficiency of vitamins K and C as the cause and claims good results with vitamin therapy. Another believes that the condition is due to iso-immunization against an inherited antigen "h" which results in a haemolysin reacting only with cells at a temperature lower than body-heat, similar to that described by DONATH & LANDSTEINER. The appearance of the disease at birth is explained by the new-born animal's precipitate entry into a colder environment than the uterus. Another worker observes the harmful effects of the maternal colostrum on the new-born mule, during the first eight days after birth; thereafter the milk is safe.

Another worker, after observing that certain parental combinations resulted in an icteric mule, whereas the same animals differently mated may produce normal mules, regards a deficiency in histaminase production as the cause. The value of transfusion of blood, other than that of the dam, as a therapeutic measure, is agreed.—G. F. R.

BRUNER, D. W., HULL, E. F., & DOLL, E. R. (1948.) The relation of blood factors to icterus in foals.—*Amer. J. vet. Res.* 9: 237–242. 1948

It has been shown that icterus in new-born foals is due to the formation of an agglutinin in the mare's serum against the red cells of the foal. The latter contain a blood factor, derived from the sire, which is incompatible with the blood of the dam. The resulting agglutinin is secreted in the colostrum and gives rise to a haemolytic anaemia with jaundice in the foal.

The investigations relate to three groups of animals. For the first group 12 mares were selected because they had at some time given birth to icteric foals. They had been in breeding studs from 6–18 years and had borne 21 icteric foals, of which six had survived. Three mares had had icteric foals by more than one stallion. Each mare had at least two living foals, and one had ten.

Of these 12 mares, ten were bred and were studied during pregnancy by the authors. The serum from each mare was tested against the red cells of the stallion to which it was bred. Agglutination resulted in every case but one, and to this mare a healthy foal was born. It was noticed that this mare's serum nevertheless contained an agglutinin against the stallion which sired the previous, icteric, foal. This agglutinin fell in titre during the last pregnancy and was found also in the healthy foal's serum after suckling.

The remaining nine mares, though served by stallions having apparently incompatible erythrocytes, bore foals which were apparently healthy at birth; their progress thereafter was studied.

In the serological investigations an initial serum dilution of 1:2 was employed because undiluted serum gave non-specific agglutination. 50% suspensions of washed red cells were used, the results being more clear cut than with weaker suspensions. In cross-matching with the affected foal's cells, it was found that they were not always easily agglutinable [a similar phenomenon to that seen with human cells coated with an incomplete form of anti-Rh antibody], especially when the haemagglutinin titre of the mare had been rising rapidly during the pregnancy. In such cases, the stallion's cells were used to confirm the reactions expected of the foal's cells. Serum investigations were started on the mares between the fifth and

seventh months of pregnancy. Haemolysins were also sought, either by using the mare's serum fresh, or by using g. pig complement.

It was found that the agglutinin titres of the mares in some cases rose, in some cases fell and in others remained constant, during pregnancy. In no case did the stallion's serum agglutinate the mare's cells. At birth, but before suckling, the antibody titre both of the serum and colostrum of the mare was determined. If the former were higher than 1:4, and the latter higher than 1:16, the foal was not allowed to be suckled by its dam, and nurse mares were used. On these criteria, five of the mares were considered to be severely immunized, and four of the foals survived in a healthy condition with nurse mares (though one subsequently died of *Shigella* infection). The fifth foal, despite the contra-indications, was allowed to be suckled by its dam and rapidly developed icterus, but recovered after compatible transfusion and transfer to a nurse mare. The remaining four foals were allowed to be suckled by their dams because the agglutinin titres in the serum and colostrum of the latter were lower than the levels specified above. Three of them developed mild icterus which resolved without treatment. The fourth appeared to have inherited the blood group constitution of its dam and was thus compatible, and not that of its sire which had been found to be incompatible; this foal had no signs of icterus.

In *post-partum* investigations it was found that the serum titre remained constant for several weeks [in contrast to human blood-group iso-immunization in which a marked rise in titre occurs invariably during the first 30 days *post partum*]. The colostrum titres were usually higher than that in the serum, but rapidly fell in 12 hours, as milk replaced colostrum.

The second group of nine mares bore icteric foals. Eight of them had previously borne healthy foals, but in one case the first foal born to the mare was icteric. The observations on this group were related to treatment *post partum*. The removal of 1,500 ml. of blood from the sick foal, and a replacement of 2,000 ml., is recommended together with transfer to a nurse mare. Six of the nine foals died, three of them before treatment could be started. It was noticed that a specific haemolysin titre of 1:10 was present in the mare's serum, in cases of icterus.

The last group of five mares was treated experimentally. In the last three months of pregnancy intravenous administration of stallion's citrated red cells (three injections of 30 ml. at weekly intervals) was carried out. Three of the mares failed to develop agglutinins (probably because the blood groups were compatible) and

the fourth developed only a low titre and the foal was healthy. The fifth mare developed a very high titre of specific agglutinins both in the serum and colostrum (much higher than the titres of the field cases), but the foal, though suckled by the dam, surprisingly developed only a transient icterus which resolved spontaneously.

Two 15-day-old foals were given [presumably intravenously] 500 ml. each on successive days of plasma from a mare which had borne icteric foals. Both the foals developed icterus to a marked degree, but recovered without treatment. Icterus was not produced in one five-day-old foal when plasma was placed in the stomach.

An attempt to produce specific antisera in rabbits by means of red cells from a stallion and a donkey stallion, failed.—G. FULTON ROBERTS.

MOLLISON, P. L., MOURANT, A. E., & RACE, R. R. (1948.) **The Rh blood groups and their clinical effects.**—*Med. Res. Coun. Memo.* No. 19. pp. 74. London: H.M. Stat. Off. 1s. 6d. 1949

The complexity of the Rh blood groups and their importance in widely differing scientific fields call for a clear and comprehensive account of the present state of knowledge of the subject. This memorandum admirably fulfils the purpose.

After a brief introduction, in which the history of the discovery of these groups is traced and the basic pathology outlined, the monograph is divided into three sections.

In the first, Race shows that the important distinction between Rh positive and Rh negative individuals is based on the presence or absence of the D antigen in the red cells. The majority of clinical effects which arise from the Rh blood groups is due to the immunization of a Rh negative individual to the D antigen. The individual's antigenic composition is also important from the genetic point of view, since a person heterozygous in respect of the D antigen (*i.e.*, having the antigenic structure Dd) is capable of transmitting the d antigen to the offspring and may therefore, if mated to a rhesus negative partner, have rhesus negative children. On the other hand, a homozygous person (DD) may only have rhesus positive children.

An account of Fisher's hypothesis of triple allelomorphs and the CDE nomenclature is next presented, followed by tables of incidence of the genotypes and the approximate errors in genotype determination with the available sera. A short account is given of the additional allelomorphs at the C and D loci, and mention is made of the importance of Rh blood groups in medico-legal problems and in ethnology. There is a short description of the rhesus antibodies and their frequency. Those antibodies which directly agglutinate the red cells are called saline agglu-

tinins. Another class of antibodies (similar in specificity and in their pathogenic effects) do not agglutinate cells suspended in saline, though they become attached to the cell receptors and so prevent the saline antibody from agglutinating them; these antibodies, however, will agglutinate the appropriate cells when they are suspended in 20% bovine albumin (or other protein media) and are thus known as albumin agglutinins.

The second section, by Mollison, is devoted to the clinical aspects of diseases which result from incompatibility between the Rh blood groups. The importance of these groups in blood transfusion is considered, and iso-immunization in pregnancy is carefully reviewed. Proper emphasis is laid on the interrelationship of transfusion and pregnancy as causes of immunization, and it must be remembered that sensitization as a result of incompatible transfusion may deprive a young female of the power to bear healthy children. The importance of testing for antibody late in pregnancy is properly emphasized, for the antibody may not appear in the serum until the seventh or eighth month. The clinical syndromes of haemolytic disease of the new-born are described and the differential diagnosis is considered. A valuable section deals with the indications for treatment and the transfusion techniques involved.

In the final section Mourant gives a lucid and detailed account of the laboratory techniques for testing blood samples for the Rh groups and their antibodies.

An authoritative and thorough handbook.

—G. FULTON ROBERTS.

ANON. (1948.) **Tests of paternity.**—*Lancet.* 254. 837-838. 1948

A discussion of the legal implications of paternity tests in human beings with reference to the compulsion of the contending parties to submit to blood group determinations. The discovery of the Rh combinations gives an even chance that an innocent accused man could be exonerated. [More recent discoveries have improved the chances even further, but the sera employed are scarce and the claims of research compete for their use at present.]—G. FULTON ROBERTS.

HABEL, K., ENDICOTT, K. M., BELL, J. F., & SPEAR, F. (1949.) **Immunological evidence on the role of the lymphocyte in antibody formation.**—*J. Immunol.* 61. 131-141. [Authors' summary copied *verbatim*.] 1951

In summary, it seems from the evidence here presented that the relatively high antibody content of lymph may be accounted for, at least in part, by physical transfer from blood. The ratio of lymph antibody to serum antibody increases when the node has been stimulated by an irritant such

as a heterologous antigen. There is very little significant evidence in these experiments to indicate that the lymphocytes or lymph node cells *per se* carry large amounts of antibody. Until more critical immunological technics and better controlled experiments are employed, the immunological evidence for lymphocyte production of antibodies must be considered incomplete.

CRADDOCK, C. G., Jr., VALENTINE, W. N., & LAWRENCE, J. S. (1949.) **The lymphocyte. Studies on its relationship to immunologic processes in the cat.**—*J. Lab. clin. Med.* **34**: 158-177. [Authors' summary copied *verbatim*.] 1852

A review of the existing knowledge of the relationship of lymphoid tissue and the lymphocyte to immunologic processes is presented. Brief analysis is made of the theory of pituitary-adrenal cortical control of lymphoid tissue structure and function.

An experimental approach is presented for the study of the antibody content of lymphocytes collected from the thoracic duct lymph of cats. Using the technique described, typhoid vaccine as an antigen, and the cat as the experimental animal, no antibody could be detected within extracts of washed lymphocytes. Comparative titrations of the relative antibody content of lymph fluid free of cells and lymph containing large numbers of lymphocytes which were artificially lysed in order to release their protein content into the surrounding lymph fluid also failed to indicate the presence of any antibody within the lymphocytes.

A group of cats was exposed to 1,500 r whole body roentgen radiation during the period of thoracic duct drainage. This amount of X-ray is in excess of the dosage required for maximal lymphoid tissue destruction. Lymphocyte production diminished markedly after this procedure as evidenced by the fall in output of thoracic duct lymphocytes. Exposure of the animals to X-ray did not significantly alter the antibody content of the cell-free lymph fluid. This is interpreted as indicative of the slight or negligible amount of antibody released from lymphoid tissue by X-ray damage of cells.

It was observed that the antibody concentration in the blood serum rose significantly during the period of thoracic duct drainage (six to eight hours) in 50 per cent of the animals. This was true in those animals exposed to X-ray as well as the others. This continued rise in serum antibody titer in spite of lymph drainage, particularly in those animals exposed to X-ray two hours after operation, suggests either continued antibody formation by some more radioresistant tissue than lymphoid or release of preformed antibody from

cells or tissue spaces directly into the blood without the necessity of lymphocytic transport of antibody.

Administration of large doses of adrenal cortical hormones (Upjohn) to a small group of cats failed to cause any significant alteration in the antibody content of cell-free lymph fluid.

A discussion of the results is presented, emphasizing the possible criticisms of the technique used. It is concluded that, under the experimental conditions of the experiments, no evidence for lymphocytic transport of antibody to the blood was found.

ROTH, L. W., & SHEPPERD, I. M. (1948.) **Absence of protective action of rutin in anaphylactic and histamine shock.** [Correspondence.]—*Science*. **108**: 410-411. 1853

The authors reinvestigated reports that rutin protects sensitized animals against subsequent anaphylactic, but not against histamine shock. To avoid thoracic injuries and false shock consequent upon thoracic injections, they administered assailing doses of antigen or histamine intravenously. Rutin as the methyl-glucamine salt was injected intraperitoneally in doses of 1-20 mg., from 4-45 min. before the assailing dose was given.

Using g. pigs, group A animals were sensitized against horse serum, group B against egg-albumen and group C received histamine. The assailing dose of egg-albumen and the dose of histamine corresponded to known L.D.100 for this population, whilst that of horse serum killed only four of eight controls. Group A comprised eight controls and 27 rutin treated g. pigs; group B, 20 and 18; and group C, 10 and 9 respectively. Shock reactions were reported as being absent, non-fatal or fatal.

No significant difference was found between controls and rutin-treated animals. In group B there was a border-line probability ($P = 0.02$ to 0.05) of there being some protection due to rutin treatment.—R. J. FITZPATRICK.

LEGER, J., LEITH, W., & ROSE, B. (1948.) **Effect of adrenocorticotrophic hormone on anaphylaxis in the guinea pig.**—*Proc. Soc. exp. Biol. N.Y.* **69**: 465-467. [Authors' summary copied *verbatim*.] 1854

The administration of adrenocorticotrophic extract to sensitized guinea pigs prior to injection of a shock dose of antigen failed to influence the course of anaphylactic shock in a group of 18 animals.

BARR, M., & GLENNY, A. T. (1949.) **Factors influencing the maintenance of antitoxic immunity.**—*Lancet*. **256**: 646-649. [Authors' summary copied *verbatim*.] 1855

Production of antitoxin continues for months or years after the last injection of antigen. It is

suggested that cells bearing antigen must multiply, as patterns by which new antitoxic globulin is formed. It should be possible to devise a course of immunisation for children which would confer lifelong immunity.

Levels of antitoxin in both guineapigs and horses are maintained better if the secondary

See also absts. 1727 (anthrax); 1736 and 1737 (tuberculosis); 1739 (glanders); 1740-1742 (swine erysipelas); 1757 and 1758 (brucellosis); 1765 (capsular antigens); 1771 (leptospirosis); 1775 (dourine); 1796 (foot and mouth disease); 1800 and 1801 (rabies); 1806 (antiviral sera); 1808 and 1809 (rinderpest); 1812 and 1813 (swine fever); 1872 (fascioliasis).

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

KRANICH, J. W. (1947.) Der Wirkungsmechanismus des Ungeziefermittels T 14. [The effect of the parasiticide T 14.]—*Dtsch. tierärztl. Wschr.* 54. 185-186. 1856

T 14 is a paste composed of nicotine, a salicylic acid phenyl ester and a small amount of liquid paraffin as a solvent. Nicotine causes tetany of the parasites and the liberated phenol tonic-clonic spasms, without toxic effects to the host.—M. LATZKE.

VERBÜCHELN, B. (1947.) Läuse- und Räudebekämpfung mit T 14 bei Pferden. [Control of lice and mange in horses with T 14.]—*Dtsch. tierärztl. Wschr.* 54. 186-187. 1857

T 14 powder is stated to be effective against lice, nits and mange.—M. LATZKE.

WEBB, J. E., & HARBOUR, H. E. (1946.) Occurrence of foot louse of sheep in the British Isles. [Correspondence.]—*Nature, Lond.* 158. 587. 1858

The authors record a heavy infestation of *Linognathus pedalis* on the legs of cross-bred Suffolk sheep in Essex. This is the first known occurrence of this parasite in Great Britain.

—J. B. CRAGG.

ALICATA, J. E., HOLDAWAY, F. G., QUISENBERRY, J. H., & JENSEN, D. D. (1946.) Observations on the comparative efficacy of certain old and new insecticides in the control of lice and mites of chickens.—*Poult. Sci.* 25. 376-380. 1859

The insecticides used in this experiment were D.D.T., 10% "Lethane A-70", "N.H. Dust", sodium fluoride, sodium fluosilicate, sulphur dust, rotenone, pyrethrum, nicotine (dilution of "Black Leaf 155") and nicotine sulphate ("Black Leaf 40"). Six g. of each insecticidal dust were applied to each bird with a shaker and dispersed through the feathers by hand. Pyrophyllite was used for diluting the insecticides when required. Nicotine sulphate was used as a perch paint. The tests were carried out on 150 mature fowls. They were infested with body lice (*Menopon gallinae*, *Goniocotes gallinae*, *Eomenocanthus stodineus*), wing lice (*Lipeurus caponis*), and wing mites (*Ptero-*

stimulus is toxoid rather than alum-precipitated toxoid (A.P.T.).

Large-scale experiments on volunteers are needed to test the efficiency of different methods of immunisation. It is suggested that medical students would be useful subjects for observation for five years.

lichus obtusus); a few groups were infested only with body mites (*Megninia cubitalis*).

The method of assessing the degree of infestation before and after treatment is described. 10% "Lethane A-70" and undiluted "NH Dust" were superior to the other insecticides in their ability to kill all the lice and mites within 48 hours of application. 5% D.D.T., undiluted sodium fluoride and undiluted sodium fluosilicate were equally effective in killing body and wing lice, but were only partially effective in controlling mites.

A single application of 10% "Lethane A-70" to a group of 12 chickens infested with *Dermanyssus gallinae*, together with dusting of the house and ground underneath, killed all the mites on the birds and were effective in reducing the numbers present in the house and on the ground.

No harmful effects were noticed from these dusts either to the operators or to the chickens.

—J. D. BLAXLAND.

SHANAHAN, G. J., & MORLEY, F. H. W. (1948.) Sheep blowfly control. Jetting with B.H.C. experiments at Trangie and Bellata.—*Agric. Gaz. N.S.W.* 59. 271-273. 1860

Spraying of the breech region of ewes (jetting) with 0.3 and 0.5% benzene hexachloride-xylol emulsion gave a degree of protection against fly strike similar to that provided by the commonly used insecticide, calcium arsenite. Benzene hexachloride had no ill effects when sprayed on extensive strikes. It is not considered safe to use arsenical compounds for jetting sheep which are already fly-struck.—H. McL. GORDON.

SHANAHAN, G. J., & MORLEY, F. H. W. (1948.) Poll strike in rams. B.H.C. as a preventive. Further trials at Nyngan and Trangie.—*Agric. Gaz. N.S.W.* 59. 263-264. 1861

In a number of field trials the application of a 1% dispersion or emulsion of benzene hexachloride (18% γ -isomer content) provided useful protection against blowfly strike on the heads of Merino rams.—H. McL. GORDON.

STAMP, J. T., WATT, J. A., & BEATTIE, I. S. (1948.)

A field trial of M 42 (DDT) dip in the control of sheep myiasis.—*Vet. Rec.* 60. 885-886. 1862

Groups of neighbouring farms with equal "probable strike incidence" were chosen and sheep on one farm in each group were dipped in D.D.T. at bath concentrations of 0.5%, the others being dipped in commercial arsenical dip. By this means the possibility was avoided that sheep which had been previously dipped in D.D.T. would so lower the local fly population that strikes might be lowered on undipped sheep running with them.

Records of fly strikes indicated that D.D.T. gave slightly better protection than did arsenic on clean sheep. On sheep with diarrhoea no conclusions could be drawn except that D.D.T. was of little, if any, value.

The authors discuss previously published results of the use of D.D.T. against sheep blowfly and conclude that convincing experimental evidence that D.D.T. has greater efficiency than arsenic as a blowfly dip has still to be obtained.

—G. B. S. HEATH.

COOLEY, R. A., & KOHLS, G. M. (1945.) *The genus Ixodes in North America.*—*Nat. Inst. Hlth Bull.* No. 184. pp. 246. 1863

This very useful publication covers 41 species of *Ixodes* which occur in North America. The various features used in classification are very clearly defined and the genus fully described. Keys to females and males are given although, as a side light on the unsolved problems of the genus, the males of some 16 species are apparently unknown. Keys are also given to those nymphs which have so far been described. In the description of each species a map is given of its distribution and comments are made on the hosts of both adults and immature stages. It forms a very important contribution to a study of the genus.

—J. B. CRAGG.

COOLEY, R. A. (1946.) *The genera Boophilus, Rhipicephalus, and Haemaphysalis (Ixodidae) of the New World.*—*Nat. Inst. Hlth Bull.* No. 187. pp. 54. 1864

This is a publication comparable to that of COOLEY & KOHLS [see preceding abst.]. The seven species making up these genera are adequately described and hosts and distribution are mentioned.—J. B. CRAGG.

I. THEILER, G. (1945.) *Ticks in the South African Zoological Survey Collection. Part V. —Three African haemaphysalids parasitic on domestic stock.*—*Onderstepoort J. vet. Sci.* 20. 191-207. [Author's summary copied verbatim.] 1865

II. THEILER, G. (1947.) *Ticks in the South African Zoological Survey Collection. Part VI.*

—Little known African rhipicephalids.—*Ibid.* 21. 258-300. 1866

I. The descriptions of the adults of *H. aciculifer*, *H. parmata* and *H. silacea* and of the immature stages of *H. parmata* are brought up to date.

The larvae and nymphae of *H. aciculifer* and of *H. silacea* are described for the first time.

The discontinuous distribution of *H. aciculifer* in the Union is shown to be due to the facts (a) that this is an introduced tick, (b) that the introduced cattle distributed from dispersal centres, were only sent where they were needed and not to all farms in any given region, (c) the tick only managed to maintain itself in those areas where conditions were favourable. Cold and frost seem to be the factors limiting its distribution.

H. silacea is shown to be confined to the Fish River Bush, so characteristic of certain parts of the Eastern Province of the Cape Colony.

II. The descriptions of six *Rhipicephalus* species are brought up to date, the nymphs of three species and the larva of one species are described for the first time, two doubtful names are shown to be valid, and five names are omitted as synonyms. There are 53 figures, mainly line-drawings.—L. DAVIES.

KATES, K. C., & RUNKEL, C. E. (1948.) *Observations on oribatid mite vectors of Moniezia expansa on pastures, with a report of several new vectors from the United States.*—*Proc. helminth. Soc., Wash.* 15. 10-33. 1867

This paper reports six species of oribatid mites capable of acting as vectors of the sheep tape worm. Four of these are reported as vectors for the first time and one is reported for the first time in the U.S.A.

Detailed observations were made on the systematic position, distribution, ecology, cysticeroid infection rates and cysticeroid capacities of these mites.—D. LUKE.

PUJOS. (1947.) *Traitement dans l'armée des gales du cheval par le benzoate de benzyle.* [Treatment of mange in army horses with benzyl benzoate.]—*Rev. vét. milit.* 2. 246-249. 1868

In experiments on 14 horses and 54 mules, a solution containing 1 kg. benzyl benzoate and 1 kg. soft soap made up to 8 l. with denatured alcohol was found to be as effective as sulphur fumigation; the treatment was more costly, however, but easier and safer to manipulate.—N. D.

ANON. (1948.) *Chorioptic mange in cattle.*—*Agric. Gaz. N.S.W.* 59. 270. 1869

Chorioptic mange is reported in a stud herd. Treatment with lime-sulphur solution (1% polysulphide), repeated three times in a week provided

control. The distribution and nature of the lesions are described.—H. MCL. GORDON.

SAID, M. S. (1946.) *Mange in Egyptian camels. The morphology, life-history and bionomics of *Sarcoptes scabiei* var. *cameli* with an outline of the history, pathology and treatment of the disease.*—*Thesis, Cairo*. pp. 85. 1870

The author gives a review of the literature of camel mange, describes the parasite and gives an identification key.

Surmise is made as to the periods of egg laying and the period of incubation of the eggs, and it is suggested that the mite may sometimes be ovoviviparous.

Experiments were carried out upon the viability of the larvae under various conditions. In darkness and at room temperatures in Egypt the parasites isolated from scrapings and provided with a humid atmosphere survived up to four days. Light reduced the viability. Eggs kept at room temperature hatched in 2–4 days. The eggs survived at least four to five days in the refrigerator

See also absts. 2011 (technique); 2015 and 2016 (blowflies and other parasites in Australia); 2018 (in U.S.A.); 2020 (handbook for identification of insects of medical importance).

PARASITES IN RELATION TO DISEASE [HELMINTHS]

SZAFIARSKI, J. (1946.) *Przyczynę do serologicznego rozpoznawania motylicy owczej. [The serological diagnosis of ovine fascioliasis.]—Med. Wet. 2. 217–219. [Abst. from French summary.] 1872*

In describing the development of a method for the diagnosis of fascioliasis in sheep by the use of the precipitation test, S. concludes that there is a specific reaction against an antigen prepared from the fluke and that its use allows the diagnosis of infection when clinical diagnosis fails.—S. B. K.

KIKUTH, W., & GÖNNERT, R. (1948.) *Experimental studies on the therapy of schistosomiasis.*—*Ann. trop. Med. Parasit.* 42. 256–267. 1873

A strain of *Schistosoma mansoni* was maintained in chronically infected rhesus monkeys and in *Planorbis guadeloupensis* snails which were cultured in aquaria in the laboratory. Snails were infected by exposing them to miracidia from about 80 *Schistosoma* eggs and at 26°–28°C. mature cercariae emerged in 4–7 weeks. The cercariae were injected subcutaneously into experimental animals, mice receiving 50–60 cercariae and monkeys 200–300. Young schistosomes matured in about six weeks, eggs appearing in the faeces on the 48th day. At this stage mice were given various compounds daily for six days and the chemotherapeutic effect noted. The excretion of eggs was used as the criterion for therapeutic activity and further evidence was obtained from P.M. examination. Derivatives of xanthone and

(7°–12°C.). From his own and other experiments, S. concludes that even in the most favourable conditions for the parasites, an infected area becomes free from them in at most 4–5 weeks. He carried out transmission experiments in which he showed that *S.s. cameli* is transmissible to horses, but not to cats, dogs or rabbits; only transiently so to donkeys and cattle; and probably also to man.

Treatment is discussed.—A. W. MARRABLE.

KEMPER, H. E. (1948.) *Progress report on benzene hexachloride for the destruction of sheep scab mites.*—*Vet. Med.* 43. 76–79. 1871

Benzene hexachloride at bath concentrations of 0.56, 1, and 1.5% (0.033, 0.06, and 0.09% γ -isomer) was used to dip sheep in three flocks in which scab was endemic. A complete cure was achieved with no re-appearance of mites during the 39 days following dipping, but K. points out that scab mites in the original lesions appeared to be very inactive, even before treatment.

—G. B. S. HEATH.

thioxanthone were among the substances used and the name miracil was given to them. These compounds have different effects with mice and with monkeys. In mice miracil B is very effective. In monkeys miracil D has the best effect. The miracil group has great practical advantages in that the drugs can be given by mouth—S. B. K.

WATSON, J. M., AZIM, M. A., & HALAWANI, A. (1948.) *Investigations of the antibilharzial action of Miracil D (Nilodin).*—*Trans. R. Soc. trop. Med. Hyg.* 42. 37–54. 1874

The drug miracil D (1-methyl-4-diethyl-aminoethylaminothioxanthone hydrochloride) was found to be effective against *Bilharzia mansoni* and *B. haematobia* in mice, jerbils and monkeys which had been exposed to experimental infection, an effective dose being 40–50 mg. per kg. on successive days. As with other anti-bilharzial drugs the first effect was to cause the parasites to retreat from the mesenteric into the portal vein and liver, whence they gradually emerged if the dose was insufficient. The question of dose level is therefore of paramount importance, the blood level varying in individuals as the result of such factors as urea clearance rate, this being particularly marked in a series of clinical trials with human patients.

The history of attempts to develop a drug for the oral treatment of bilharzia infestation is reviewed in the light of the recent developments with miracil D, its pharmacology is considered

and the toxic symptoms with human patients are recorded.—S. BRIAN KENDALL.

KELLY, B. J. G. (1948.) *Paramphistomum cervi* in cattle in Ireland.—*Irish Vet. J.* 2. 241–242. 1875

Three cases of *Paramphistomum cervi* in cattle are described from the Dublin abattoirs and similar parasites are reported to have been seen in sheep in 1945.—S. BRIAN KENDALL.

KUPPUSWAMY, P. B. (1948.) "Pitto" and "Gillar" [Amphistoma infection] in sheep and goats.—*Indian Fmg.* 9. 73–74. 1876

K. records acute gastro-enteritis caused by infestation with immature amphistomes in sheep and goats in swampy districts in Bihar. There was mortality of 80–90%. He details briefly treatment given.—P. R. K. IYER.

I. CRUSZ, H. (1948.) Observations on a case of endogenous budding in *Cysticercus tenuicollis* Rudolphi.—*J. Helminth.* 22. 63–72. 1877

II. CRUSZ, H. (1948.) On an English case of an intramedullary spinal coenurus in man, with some remarks on the identity of *Coenurus* spp. infesting man.—*Ibid.* 73–76. 1878

I. Together with many normal cysticerci on the mesentery of a goat in Ceylon, Crusz observed one cysticercus which contained many daughter cysts and one daughter cysticercus. He pointed out the similarity between the daughter cysts, which are lined internally by cuticle and are devoid of scolices, and the brood capsules of *Echinococcus*. He shows that these cysts were produced by invagination of the wall of the parent cysticercus. The daughter cysticercus, in which the cuticle was on the outside, he considers was formed by evagination of a daughter cyst rather than by vesiculation of a scolex from the parent cysticercus.

II. C. makes further observations on a coenurus previously reported by Buckley (1947) to have been removed from the spine of a girl in London. He discusses previous reports of human coenurosis and points out the difficulties which are involved in making a diagnosis as to the species concerned. He stresses the possibility that the different species described in man may actually be different developmental stages of a single species.—J. F. A. SPRENT.

CRUSZ, H. (1948.) On the transverse fission of *Cysticercus pisiformis* in experimentally infested rabbits, and the phylogenetic significance of asexual phenomena in cysticerci.—*J. Helminth.* 22. 165–178. 1879

This paper describes transverse fission in the liver of rabbits of the bladder-worm *Cysticercus pisiformis*. The fission is brought about by annular constrictions which result in the production of two

or three parts, the posterior one of which is normally acephalic. The phenomenon was originally described by Moniez in his classical monograph on the cysticerci, but more recent investigation had suggested that the observations were isolated or abnormal. There is a useful bibliography, some account of staining and methods of fixation and a discussion of the phylogenetic significance of the process.—S. B. K.

FOSTER, A. O., & HABERMANN, R. T. (1948.) Lead arsenate for removal of ruminant tapeworms.—*J. Amer. vet. med. Ass.* 113. 51–54. 1880

The authors discuss the efficacy of lead arsenate for the removal of tapeworms in ruminants. They consider that this substance can be used safely and effectively, although they point out that our knowledge of its toxicity is as yet incomplete, particularly in regard to pregnant animals and under conditions of repeated dosage. Removal of tapeworms by lead arsenate has resulted in decided improvement in the health of infected animals, an observation which indicates that under certain conditions these parasites may be pathogenic to lambs, kids and calves. Whether animals which have been dosed with lead arsenate are safe for human consumption is not yet verified, although preliminary determinations are encouraging in this respect.—J. F. A. SPRENT.

BRITO-BABAPULLE, L. A. P. (1946.) Phenothiazine and the elephant caecal worms.—*Vet. J.* 102. 368. 1881

Four young elephants believed to be affected with helminthiasis were each given 10 g. of phenothiazine in banana skins, daily for four days. Some worms which were identified as *Equinurba sipunculiformis* and *Murshidia falcifera* were expelled.—J. E.

KEMPER, H. E., & ROBERTS, I. H. (1946.) Treatment of filarial dermatosis of sheep with antimony compounds.—*Amer. J. vet. Res.* 7. 350–354. 1882

A series of intravenous or intramuscular injections with 10–40 ml. trichicide [a commercial preparation consisting of sodium antimonyl tartrate in solution with trypanblue and 1% phenol] resulted in healing of skin lesions, but toxic symptoms were observed with doses of over 35 ml.

Tartar emetic alone or with emetine hydrochloride produced abscess formation. Tartar emetic with glucose gave good results. This preparation is an inexpensive remedy, but the treatment extends over a period of two months.

Anthiomaline [a 6% solution of lithium antimony thiomalate] and fuadin [a 6.7% solution of sodium antimonyl catechol disulphonate] pro-

duced healing with one injection of 35 ml. of the respective drug.—M. LATZKE.

TURK, R. D., & HALE, F. (1948.) **Observation on the use of sodium fluoride as an ascaricide in swine.**—*J. Amer. vet. med. Ass.* 112. 363–366. 1883

In tests on 302 pigs sodium fluoride was found to be a satisfactory ascaricide. Conclusions were drawn on the basis of the number of worms removed, compared with animals treated by the

See also absts. 2015 and 2016 (in Australia); 2018 (in U.S.A.).

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

JULIAN, L. M. (1948.) **Multiple cisternal polyps of the bovine mammary gland.**—*J. Amer. vet. med. Ass.* 112. 238–240. 1884

When a nine-year-old Holstein-Friesian cow was slaughtered, about 20 tumours of varying size were observed in one quarter of the udder on the lining of the milk cistern and at the openings of the larger ducts. The smaller tumours were about 3 mm. high, the larger ones 2–3 cm., the latter growing as multilobular club-shaped projections. Two of the masses had broken free into the cistern. The tumours were composed mainly of vascularized fibrous tissue, with mononuclear inflammatory cells scattered throughout the substance, and were covered by epithelium which had patches of squamous metaplasia. The tissue of the tumours arose from the tunica propria of the cistern wall.

J. suggests that the term “multiple cisternal polyps” best describes the pathology of the lesions. [In view of the use of the term “polyp”, which is sometimes applied to inflammatory structures, it should be noted that the author writes of the lesions here described as being neoplasms.]—E. COTCHIN.

SAUTTER, J. H., & SELLERS, A. F. (1948.) **A case of bovine lymphoblastoma (leukemia) with unusual blood findings and an apparently short clinical course.**—*Cornell Vet.* 38. 317–324. [Discussion and summary copied *verbatim*.] 1885

In view of the history that the supramammary nodes did not appear to enlarge greatly until the animal began making udder, the development of acute symptoms a short time following parturition, and the fairly immature-type cell with evidence of rapid proliferation found in the tumorous masses, it is conceivable that changes incident to parturition increased the rate of growth of the process. HUTYRA *et al.* [see *V.B.* 8. 828] note that pregnancy, parturition, and lactation, or change of external conditions, often appear to exercise an unfavorable influence on the course of the disease.

routine chenopodium method, and of the subsequent appearance of the animals.

Safe treatment of small pigs (25 lb.) may be accomplished by giving one lb. of feed to which has been added five g. of sodium fluoride. In larger pigs this dose may be repeated after 12 hours. The treatment is equally effective with dry feed or with swill, but swill feeding is not recommended for group treatment. Given in skim-milk the drug was distasteful to the animals and caused vomiting and diarrhoea.—N. DEAN.

LOCKE, R. F. (1948.) **Thymoma in a cat.**—*J. Amer. vet. med. Ass.* 112. 245. 1886

A two-year-old male Persian cat died after an illness accompanied by marked dyspnoea. When examined P.M. the thoracic cavity contained about 100 ml. of straw-coloured fluid, and a large greyish tumour mass, measuring about 10 cm. long and, in its greatest diameter, about 5 cm. wide and roughly conforming to the shape of the thorax, was found to invest the trachea, oesophagus and heart, displacing the lungs. The tumour was reported by the Army Institute of Pathology as “lymphosarcoma, thymus, feline”.

—E. COTCHIN.

GUILBERT, H. R., WAHID, A., WAGNON, K. A., & GREGORY, P. W. (1948.) **Observations on pigmentation of eyelids of Hereford cattle in relation to occurrence of ocular epitheliomas.**—*J. Anim. Sci.* 7. 426–429. 1887

The authors stated that eye cancer of Hereford cattle was of economic importance. A description of the lesion and its incidence was given.

They suggested that continuous sunburn of the moist non-pigmented areas of the lower eyelids predisposed to cell derangements and the appearance of ulceration. With continued irritation these areas might become malignant. This was said to be especially likely to occur in cattle which had a hereditary predisposition to cancer. There was some evidence which suggested a relationship between pigmentation and susceptibility and the authors suggested that the aim should be to breed cattle with red around the eyes.—A. R. JENNINGS.

ROUS, P. (1947.) **Concerning the cancer problem.**—*Science in Progress.* Ser. 5. pp. 197–234. 1888

This is a general article on the aetiology of cancer. There is no new information. R. deals largely with viral causes of neoplasia after discussing briefly other causes.—A. R. JENNINGS.

MEYER, J. R. (1947.) Ação antineoplásica dos filtrados de cultura de "*Aspergillus flavus* Link" demonstrada "in vitro" sobre um tumor transplantável do camundongo. [Antineoplastic action of crude filtrates of cultures of *Aspergillus flavus* demonstrated in vitro on a transplantable tumour of the mouse.]—*Arg. Inst. biol., S. Paulo*. 18. pp. 239-242. [English abstr. slightly amended.] 1889

See also abstr. 2021 (biology of melanomas).

NUTRITIONAL AND METABOLIC DISORDERS

WARE, F. (1946.) An insoluble problem.—*Indian Fmg.* 7. 509-511. 1890

A discussion of the problem of milk supply in India. To provide a better balance in the Indian diets by supplying more protein and other constituents; the following measures have been advocated:—the development of poultry and fish industries; an increased use of milk buffaloes; the commercial exploitation of cross-bred dairy cattle; and the manufacture of vegetable milk from soya beans and other sources.—P. B.

ROBINSON, K. W., & LEE, D. H. K. (1947.) The effect of the nutritional plane upon the reactions of animals to heat.—*J. Anim. Sci.* 6. 182-194. 1891

The responses of animals to hot-dry and hot-wet conditions were considered in relation to (1) the plane of nutrition and (2) the effects of protein proportion in iso-caloric diets.

The first studies were made on eight fowls for 74 weeks, four wether lambs for 56 weeks and four sows for 36 weeks, half the animals being fed adequate rations and half being held at maintenance level only; reversals of diets were made. Once a week the animals were exposed to hot conditions for several hours, half of the animals to wet heat and half to dry; observations were made hourly. All the animals on the higher plane of nutrition responded with very significantly higher rectal temperature, pulse and respiration rates and greater loss of weight. The differences were greatest under hot-dry conditions. Details of the responses are tabulated.

Experiments on fowls, a dog, a sow and a wether lamb were conducted to determine the effects of changes in the protein proportion of an iso-caloric diet. No effects were found when the protein proportion varied from 5-28.5%.

—G. L. BAILEY.

POUNDEN, W. D., & HIBBS, J. W. (1948.) The influence of the ration on the digestive tract microorganisms of the young dairy calf.—*J. Dairy Sci.* 31. 672-673. [Authors' summary copied verbatim.] 1892

In this paper a series of experiments is reported showing that filtrates of cultures of *Aspergillus flavus*, grown in a medium prepared with tryptone and brown sugar, have an antineoplastic effect on cells of a transplantable tumor of the mouse, when treated in vitro. This effect begins to disappear spontaneously after the eighth day of culture and is presumed to be due to the presence of gliotoxin.

The development in the rumens of young calves of protozoa and bacteria of the types associated with alfalfa hay ingestion was helped by inoculation with microorganisms from rumens of mature stock, provided the calves were ingesting a sufficiently high proportion of hay. The numbers of protozoa increased as the proportion of grain increased in relation to the quantity of alfalfa hay ingested, until approximately equal parts of each were consumed. Further increases in the proportion of grain were accompanied by reduction in numbers of both protozoa and hay-type flora until they eventually disappeared.

Bacteria of the types associated with grain ingestion made their appearance in appreciable numbers in samples once the proportion of grain consumed exceeded the hay; they continued to increase as the proportion of grain increased. Their development was not influenced by the inoculations. Indications are that the early development of rumen microorganisms similar to those observed in cows is influenced by the feeds consumed. In addition to the beneficial effect on certain blood vitamin constituents, the general appearance of the calves fed milk and hay alone was improved by rumen inoculation.

AUBERTIN, E., DANGOUMEAU, A., & CASTAGNOU, R. (1946.) Recherches, chez l'animal et chez l'homme, sur la valeur nutritive et la toxicité de la farine de tourteau d'arachide. [Investigations, in animals and man, on the nutritive value and toxicity of flour of ground-nut cake.]—*J. Méd. Bordeaux*. 123. 161-164. 1893

Using dogs as the experimental animals the authors found that the proteins of ground nut cake flour were well absorbed and retained. The flour was tolerated even when it constituted the total nitrogen of the ration provided that the basal diet contained more carbohydrate than protein. In a maintenance diet if ground nut cake flour proteins were fed in quantity equal to that of the carbohydrates, protein poisoning and liver dysfunction were observed. When the diet consisted exclusively of ground nut cake flour the dog died

within two months. The authors concluded that this flour may be used only in moderate amounts and when mixed with carbohydrates.

In man the flour may cause colitis and disturbance of liver function. The addition of 80 g. per day to a diet somewhat low in nitrogen but otherwise adequate was tolerated but 40 g. per day appeared to be the limit of tolerance.—E. M. J.

LEHRER, W. P., Jr., MOORE, P. R., WIESE, A. C., & PAHNISH, O. F. (1948.) **A synthetic milk ration for baby pigs.**—*J. Anim. Sci.* 8. 107-111. 1894

Four piglets suckled by their dam for the first 48 hours were successfully reared thereafter on a synthetic milk diet considered to be adequate, over a period of eight weeks. Details of the composition of the diet are given, and determinations of the urinary excretion of vitamins of the B complex, at various levels of intake, indicated that the diet contained adequate amounts of these vitamins.—G. A. LINTON.

SENIOR, B. J., & KEARNEY, W. (1947.) **Chick mortality caused by war-grade wheat offals.**—*Econ. Proc. R. Dublin Soc.* 3. 293-310. [Abst. in *Nutr. Abstr. Rev.* 17. 1031. (1948), copied verbatim. Signed: M. J. HEAD.] 1895

The symptoms of a condition which has caused high mortality in young chicks during the war years is described. A diet containing 50 to 85 per cent. of pollard from 85 per cent. extracted wheat produced the condition. When the pollard was replaced by oats of a similar crude fibre content, no ill effect was observed, even when the oats were of a very poor quality giving the ration a fibre content of 12.1 per cent. Post mortem examination showed frequently, but not consistently, alimentary impaction. Substitution of bran for some of the pollard increased the mortality; feeding of liquid paraffin reduced the mortality but left stunted chicks.

The addition of charcoal to the ration, while having little effect on the mortality rate, prevented the impaction and fatty livers previously shown to be of common occurrence. A group fed on artificial pollard containing the fibre from pollard mixed with 85 per cent. extracted flour to give a ration containing 8 to 9 per cent. of fibre showed low mortality. The condition was ameliorated also by the addition of an easily digestible carbohydrate. Replacement of the pollard by oats and barley reduced the mortality considerably, while the grinding of the pollard, oats and barley completely eliminated deaths.

The economic importance of the condition is indicated by the 70 per cent. mortality rate observed in some groups, and it is compared to "six-day" chick disease. It is suggested that the

mortality rate could be lowered by feeding an easily digested carbohydrate and reducing the excess of bulky indigestible fibrous food often fed to chicks.

KING, J. D. (1948.) **The influence of diet on parodontal disease.**—*Nutr. Abstr. Rev.* 17. 569-590. 1896

K. reviews the literature on the effect of diet on teeth and the periodontal structures. In man and experimental animals vitamins A and D are necessary for normal development of teeth, shortage after maturity does not seem to affect the health of teeth greatly. The absence of nicotinic acid in dogs gives rise to a condition similar to "blacktongue" as far as the mouth and teeth are concerned. Vitamin C is essential only in man, the g. pig and the Rhesus monkey for normal dental development. Some of the causes of disease in teeth are lack of adequate friction, excess fluorine and excess phytin in the diet. It is thought that tartar deposition may be associated with the persistence of dental cuticle, Nasmyth's membrane, particularly when in close proximity to salivary ducts.—G. A. LINTON.

SCHNEIDER, H. A. (1949.) **The "yes" and "no" of nutrition and natural resistance to infectious disease.**—*Amer. J. publ. Hlth.* 39. 57-60. 1897

S. gives a synopsis of some of his work on disease resistance in relation to diet [see *V. B.* 16. 135; 17. 379; & 18. 461]. The addition of fresh wheat to a synthetic diet containing all known dietary requirements of mice induced a resistance to a dose of *Salmonella enteritidis* which proved lethal to mice receiving the synthetic diet only. The nature of the protective factor present in whole wheat is being investigated.—G. A. L.

ROSSITER, R. C., CURNOW, D. H., & UNDERWOOD, E. J. (1948.) **The effect of cobalt sulphate on the cobalt content of subterranean clover (*Trifolium subterraneum* L. var. *Dwalganup*) at three stages of growth.**—*J. Aust. Inst. Agric. Sci.* 14. 9-14. 1898

Symptoms and P.M. appearance of cobalt deficiency were observed in sheep. Top-dressing of the pasture with cobalt had no effect on the yield of *Dwalganup* strain subterranean clover but raised the cobalt content of the plant to a safe level for sheep.

It is considered that the application of 3 oz. hydrated cobalt sulphate per acre annually, or 6 oz. every two years, is sufficient to maintain an adequate level of cobalt in pastures similar to the one described.—D. C. BLOOD.

SPIELMAN, A. A., THOMAS, J. W., LOOSLI, J. K., NORTON, C. L., & TURK, K. L. (1946.) **The placental transmission and fetal storage of**

vitamin A and carotene in the bovine.—*J. Dairy Sci.* 29. 707-715. 1899

Four different rations were fed to 29 Holstein and 4 Guernsey heifers all having a similar management history, when they were brought in from pasture 60 days prior to calving. Group S was given a low carotene diet, group N a normal dry cow diet, group C a normal diet plus one million I.U. of carotene, and group A a normal diet plus one million I.U. of vitamin A per day. Estimations of plasma carotene and vitamin A were made 60 and 18 days prior to calving. There was a fall in all groups except in group A; this is claimed to be usual in cows brought in from pasture. There was a fall in carotene in group A, the difference between group A and the others being claimed to be due to the difference in diet. Group S values were significantly different from the others 18 days before calving.

There was no significant difference between plasma carotene values in the various groups of new-born calves. Plasma vitamin A values were, however, twice those of the normal group in group C, and four times those of the normal group in group A. The livers of the new-born of all groups contained carotene, the amount being proportional to the amount of carotene in the dam's diet. Total liver reserves of vitamin A *per se* were as follows:—group S, 64.5 µg.; group N, 551.1 µg.; group C, 245.6 µg.; and group A, 24,101.1 µg. The total reserve of vitamin A activity is also given in I.U. [The inclusion of liver stores of carotene in the total vitamin A reserve in the liver is of questionable validity in view of recent work with rats in which it was demonstrated that the conversion of carotene to vitamin A does not occur in the liver, but in the wall of the intestine.] It is stated that the total reserve in the livers of calves in group A is sufficient for ten days.

—ALAN A. WILSON.

WHITING, F., LOOSLI, J. K., & WILLMAN, J. P. (1949.) **The influence of tocopherols upon the mammary and placental transfer of vitamin A in the sheep, goat and pig.**—*J. Anim. Sci.* 8. 35-40. 1900

Tocopherols have a vitamin A sparing effect in rats; their influence on the transference of vitamin A as measured in the colostrum of the dam, and in the blood plasma and liver of new-born lambs, piglets and kids was determined.

Forty ewes, 25 sows and 13 goats were divided into four groups receiving the following treatments for the last six weeks of pregnancy:—group (1) received a basal diet poor in vitamin A; group (2) received the basal diet plus 12,000 I.U. of vitamin A per 100 lb. live weight; group (3) received the basal diet plus 80 mg. of mixed natural tocopherols per 100 lb.; whilst group (4)

received the basal diet plus 12,000 I.U. of vitamin A and 80 mg. of tocopherols per 100 lb.

Supplementing the basal diet with 12,000 I.U. of vitamin A daily increased the vitamin A content of the colostrum and the reserves of vitamin A in the new-born. The addition of tocopherols had no significant effect on the vitamin A content of the colostrum, or on the vitamin A reserves of the new-born.—G. A. LINTON.

MADSEN, L. L., & EARLE, I. P. (1947.) **Some observations on beef cattle affected with generalised edema or anasarca due to vitamin A deficiency.**—*J. Nutrit.* 34. 603-619. 1901

The incidence of anasarca in beef cattle is examined, and reports of cases are presented. The condition is induced by a carotene deficient diet, and may be cured by feeding any roughage that is rich in this respect. Alfalfa hay is recommended.

The results of the blood analyses of seven animals are presented and in affected animals there is an increase in the total plasma nitrogen made up primarily from the plasma fibrinogen and to a smaller extent from other globulin fraction; on the other hand plasma albumin is depressed. There is also a depression in the levels of vitamin A, carotene, vitamin C and phosphatase.—G. L. B.

FREY, P. R., & JENSEN, R. (1947.) **Depletion of vitamin A reserves in the livers of cattle.**—*Science.* 105. 313. 1902

The authors had found that in steers taken from pasture and placed on a practical fattening ration low in carotene, the vitamin A reserves of the liver decreased progressively. The data were analysed again to test the hypothesis that the rate of depletion of a vitamin in the body is proportional to the magnitude of the reserves available. It was found that in each successive interval of 40 days during the fattening period, the decrease in the liver reserves remained practically constant at 42-47% of the amount present in the liver at the beginning of that interval, a result which supported the above hypothesis.—E. M. CRUICKSHANK.

SWAHN, O., OBEL, A.-L., & WANNTORP, H. (1948.) **Om vaxartad muskeldegeneration hos lamm och dess behandling med syntetiskt E-vitamin (Ephynal vet. "Roche").** [Zenker's muscle degeneration in lambs and its treatment with synthetic vitamin E (Ephynal vet. "Roche").]—*Skand. VetTidskr.* 38. 129-146. [English summary.] 1903

Synthetic vitamin E given *per os* in 75 mg. doses appeared to have some value in the prophylaxis of Zenker's muscle degeneration in ewes. In lambs good results were obtained prophylactically and in treatment with subcutaneous injections of vitamin E.

Chemical examination of the muscle of

infected sheep did not yield any significant results. No pathological changes could be demonstrated in the spinal cord, peripheral nerves or sympathetic system.

To prevent the condition the authors recommend the addition of wheat bran or wheat germs to the ration of the ewes.—D. LUKE.

DAVIDSON, L. S. P. (1948.) **Pteroylglutamic acid (follic acid). Therapeutic indications and limitations.**—*Edinb. med. J.* 55. 400–411. 1904

Pteroylglutamic acid (PGA) is non-toxic even in large doses when administered orally or parenterally. In 85 patients with various anaemias a haemopoietic response occurred only in megaloblastic anaemia. General improvement may occur in sprue with normoblastic anaemia. PGA is not recommended for pernicious anaemia because of neurological complications. It is the drug of choice in pernicious anaemia of pregnancy and of infants, and nutritional megaloblastic anaemia.

—W. R. BETT.

SCHOOP, G. (1946.) **Vitamin-H-Mangel bei neugeborenen Nerzen. [Vitamin H deficiency in new-born mink.]**—*Dtsch. tierärztl. Wschr.* 53. 41–42. 1905

Stunted growth and light colouration of the woolly under-coat were treated successfully with "murnil", a vitamin H concentrate administered daily for ten days.—M. LATZKE.

VITTONI, R. (1948.) **Contributo alla terapia dell'ipo-avitaminosi C e B₁ dei vitelli. [Treatment of vitamin C and B₁ deficiency diseases in calves.]**—*Clin. Vet., Milano.* 71. 40–44. 1906

The author describes the syndrome of myodegeneration in calves caused by lack of vitamins B₁ and C. Three intramuscular injections of 10,000 I.U. each of vitamin B₁ were given within nine days. Vitamin C deficiency was treated parenterally with ascorbic acid, alternating with administration of vitamin C preparation *per os*. Results in both cases were satisfactory.—E. G.

MCQUILLAN, M. T., TRIKOJUS, V. M., CAMPBELL, A. D., & TURNER, A. W. (1948.) **The prolonged administration of thyroxine to cows with particular reference to the effects on thyroid function and on pituitary thyrotrophic hormone.**—*Brit. J. exp. Path.* 29. 93–106. 1907

Six pairs of dry Shorthorn cows judged comparable on a live weight basis, and three unpaired animals, were herded in a large paddock with excess supply of good grazing. After a 16-day control period, half the paired and all the unpaired animals were given a series of subcutaneous injections of thyroxine; these were made three times a week and grouped into three treatment periods, *viz* :—Seven injections of 15 mg., 11 injections of

20 mg. and 12 injections of 40 mg. thyroxine, the total treatment period being 70 days.

[The statistical analysis of the figures assumes that the results from single animals for successive treatment periods are independent variates, whereas it is usually considered that a series of measurements on the same animal are partially dependent on each other. The statistical methods used in the paper exaggerate the significance of the differences between means and the estimations of standard errors must be treated with some reserve. This criticism will not affect the conclusions drawn from the results.]

Heart and respiration rates, rectal temperatures and the specific gravity of whole blood were all increased by the treatment, but the specific gravity of blood plasma was unaffected. The live weight gains made by the treated animals were much less than those made by the control animals and on slaughter the first were graded as old cows while the latter were passed as prime heifer beef.

The treated animals became nervous and restless and had some mammary development, small quantities of a milk-like secretion could be expressed; histological examination after slaughter confirmed this observation. P.M. examination also revealed a reduction in the height of the thyroid acinar cells; this, in conjunction with the finding of a reduction in the ratio of thyroxine to total iodine of the gland, demonstrated the depression of normal thyroid function.

The anterior pituitary glands of the treated and control animals were powdered and assayed by means of two-day-old chicks for thyrotrophic hormone; it was present only in the glands of the control animals.

It was not possible to demonstrate the presence of a thyroid-inhibitory factor in the glands of the animals receiving thyroxine.—G. L. B.

HOFUND, S., & HEDSTRÖM, H. (1948.) **Rubbningar i vämdigestionen som prädisponerande faktor vid uppkomsten av acetonaemi. [Disturbances in the rumen digestion as a predisposing factor for the appearance of acetonaemia in cattle.]**—*Skand. VetTidskr.* 38. 162–177. [Abst. from English summary.] 1908

The authors distinguish between primary acetonaemia caused by under or over-feeding and secondary acetonaemia in pregnant cows shortly before calving, due to a chronic catarrhal condition of the abomasum or traumatic peritonitis.

Milk producing cows fed a diet to stimulate lactation are likely to be affected because large amounts of sugar, butter fat and vitamin B cannot be easily restored if the liver does not receive adequate sugar from the intestine. The liver is heavily overworked in order to maintain high milk

production. Sugar is prepared in the rumen by cellulose fermentation with the aid of an active flora.

If suddenly a high-protein diet is given, the fungi are not adapted to deal with the amount and toxic protein decomposition products may form and be absorbed, causing damage to the already overworked liver.

If a diet rich in cellulose is changed suddenly to a milk producing diet rich in protein, the fungi cannot multiply quickly enough to cope with it and the result is retarded cellulose digestion. As the increased sugar requirement for high milk production cannot be supplied, the body fat has to be utilized with resulting increased acetone production.

Pregnant cows need not use their body fat reserves for production of milk sugar if fed an adequate diet of carbohydrates, minerals (phosphate, cobalt) and concentrates, the latter being

See also absts. 1756 (vitamin E); 2015 and 2016 (in Australia); 2024 (chemistry for doctors, dentists and veterinarians); 2025 (practical method^s in biochemistry); 2029 (vitamins and vitamin therapy).

added in increasing proportions from one month before calving.—E. G.

HANAWALT, V. M., & SAMPSON, J. (1947.) **Studies on baby pig mortality. IV. Chemistry of the blood during fasting and refeeding of weanling pigs.**—*Amer. J. vet. Res.* 8. 73-81. 1909

Two groups of healthy pigs were fasted for 24 and 48 days respectively, and then put on a normal diet for a similar period. No pathological changes were observed in the composition of the blood during the fasting period. There was an unexplained rise in the CO₂ combining power of the blood in the fasted pigs. There was an appreciable decrease in the temperature of the fasted pigs even when kept in a heated room. Some temporary impairment of the carbohydrate metabolism was observed following the period of inanition.—D. LUKE.

DISEASES, GENERAL

ADRSERSEN, V. (1948.) Zdraví drůbeže, základ produkce. [The health of poultry as a basis of poultry production.]—*Čas. československ. Vet.* 3. 303-307. 1910

A brief discussion with statistical analysis of poultry stock and poultry diseases in Denmark in the last 20 years.—E. G.

MUIR, R. (1949.) "Blue nose" disease in the horse. Anthisan treatment. [Correspondence.]—*Vet. Rec.* 61. 139. 1911

M. reports three cases of "Blue Nose" which were treated successfully with anthisan (a synthetic anti-histaminic preparation). Three 20 ml. doses were given intravenously at intervals of eight hours.—D. LUKE.

HARSHFIELD, G. S., & REHFELD, C. E. (1948.) A chronic dermatosis of cattle due to oil applications.—*J. Amer. vet. med. Ass.* 112. 446-450. 1912

A report on cases of chronic skin disease occurring in cattle in South Dakota following the application of various oily dressings to the skin. The lesions, consisting of a thickening of the skin later becoming covered with scaly crusts up to $\frac{1}{2}$ inch thick, usually occur on the neck, head, shoulders, the dorsum and the tail. Skin scrapings were negative for parasites and biopsy samples revealed small areas of mononuclear and eosinophilic infiltration and surface accumulation of keratinized epithelium. Blood estimations of vitamin A, carotene, ascorbic acid, sodium and potassium gave values within the normal range.

Trials were carried out on animals of three

breeds using nine oils; three of these were lubricating oils and the others were mixtures of unknown composition sold for the treatment of skin conditions in animals. The lubricating oils appeared to cause fewer ill effects than the medicated oils and the Aberdeen-Angus breed to be less susceptible than Shorthorns or Herefords.—E. J. H. FORD.

COOPER, V. (1948.) Some veterinary problems of the Cape Western Area. ["Uitpeuloog" or "Blouwildebeesoog" in sheep.]—*J. S. Afr. vet. med. Ass.* 19. 146-150. 1913

This area, about one-third of the Union of South Africa, includes the arid Karroo as well as fertile areas; there are only seven veterinary officers and very little is known about the disease position.

Lumpy skin disease first appeared in 1946 and spread rapidly, died down in 1947 and flared up again in 1948.

A new condition known as "uitpeuloog" or as "blouwildebeesoog" occurred in sheep in 1948 and was characterized by nervous symptoms, blindness, a very pronounced exophthalmos with opacity of the cornea and rupture of the eyeball. Following rupture of the eyeball recovery generally took place, but when both eyes were affected the animal often died of starvation. The cause and mode of transmission are not known, but are thought to be associated with movements of the Blue Wildebeest during drought. Mortality was about 25%.

Outbreaks of fowl cholera occurred in 1948 and were dealt with by slaughter.

Bovine tuberculosis is said to be prevalent, but only 36 herds have been tested. Preliminary investigation of suspected copper deficiency in the Saldanha Bay area has been made.—M. C.

NOBLE, R. L. (1948.) **The effect of barbiturates and other substances on motion sickness in dogs.**—*Canad. J. Res. Sect. E.* 26. 283-294. 1914

A large number of barbiturates and other substances were tested for their ability to prevent motion sickness in dogs. Many compounds had this property, which was not related to the anaesthetic property of the substance. Some of the compounds were found to be considerably more active than V-12 (ethyl- β -methylallylthio-barbituric acid), which was used as a standard. On the other hand, some substances such as pyridoxine and hyoscine, effective in some types of vomiting in human beings, had no effect on the dogs. Streptomycin, which interferes with vestibular function in human beings, gave no protection to dogs against motion. Bulbocapnine [an alkaloid from the bulbs of *Corydalis caseana*] possessed half the potency of V-12 but the two substances when given together had an additive effect.—R. GWATKIN.

MENKIN, V. (1948.) **Mechanisms of leukopenia with inflammation. An additional leukopenic factor found in alkaline exudates.**—*Arch. Path.* 46. 145-158. [Author's summary and conclusions copied *verbatim*.] 1915

There is present in exudates, particularly those that are alkaline in nature, a leukopenic component closely associated with the globulins of the leukocytosis-promoting factor. This leukopenic component is thermolabile. This distinguishes it from the thermostable leukopenic factor previously described as recovered from acid exudates. The leukopenic component of exudates associated with the globulins of the leukocytosis-promoting factor seems to be a product of a protein denaturation following the initial injury of cells with the onset of inflammation. Aging the leukocytosis-promoting factor induces the further production of this leukopenic component, presumably by spontaneous denaturation. The formation of this factor tends to reduce the potency of, or even to inactivate, the usual leukocytosis-promoting factor, the factor which accelerates the discharging of polymorphonuclear leukocytes into the blood stream. To render the leukocytosis-promoting factor extracted from freshly withdrawn exudates more effective, the leukopenic component, particularly that found in alkaline exudates, is eliminated in the scheme of extraction of the leukocytosis-promoting factor.

Earlier studies have demonstrated that a

thermostable leukopenic factor is present in exudates. The knowledge that the thermolabile leukopenic component of exudates is in combination with the thermostable one helps in one's understanding of the mechanisms of leukopenia with inflammation.

The initial leukopenia induced by the thermolabile leukopenic component of exudates affects primarily the mononuclear type of white cells and to some extent the polymorphonuclear leukocytes.

The term "leukopenin" is suggested for this additional leukopenic component concerned in the mechanism of leukopenia with inflammation.

WARREN, S., & WAHL, P. N. (1947.) **Quantitative estimation of the fibrous tissue in pathologic livers.**—*Arch. Path.* 44. 563-570. 1916

Samples were examined from eight cirrhotic and 24 non-cirrhotic human livers. The amount of combined collagenous and elastic fibrous tissue was estimated by a method which consisted essentially of extracting from a weighed amount of liver substances other than collagen and elastin, and weighing the residue. There was no apparent correlation between the amount of fibrous tissue and the weight of the liver in non-cirrhotic cases, but good correlation was found between the amount of fibrous tissue microscopically visible and the weight of the liver in all except extreme cases of fibrosis. The weight of the liver decreases with increasing fibrosis.—L. M. MARKSON.

DALE, H. (1948.) **The physiological basis of neuromuscular disorders.**—*Brit. med. J.* Nov. 20th. 889-892. 1917

Adrenalin and acetylcholine are the two well-known transmitters of the autonomic nervous system, but there is evidence which suggests that histamine may be a third transmitter, being released by antidromic nerve impulses at the endings of the nerve fibres supplying the minute blood vessels of the skin.

Acetylcholine is the accepted transmitter to the motor end-plates of voluntary muscles which remain sensitive to it even after the administration of atropine but are rendered insensitive by excess of nicotine, by curarine and also by a persistent excess of acetylcholine itself. The biochemical effect of the nerve impulse is probably to release a tiny charge of acetylcholine which causes an excitatory depolarization at the surface of the ganglion-cell or motor end-plate, probably by a mobilization of potassium ions.

Curare renders the muscle end-plate insensitive to acetylcholine, but it still responds to direct stimulation or the application of potassium chloride. Botulinus toxin, on the other hand, prevents the release of acetylcholine by nerve

impulses and tetanus toxin causes a loss of cholinesterase with a continuous leak of acetylcholine at the nerve ending. In myasthenia gravis, physostigmine and other anticholinesterases exercise their beneficial effects by depressing cholinesterase.

It is concluded that the evidence for chemical transmission at synapses and nerve endings in the peripheral nervous system is clearly established and it now remains to be proved if this also holds good in the central nervous system.—J. A. N.

BRINKER, W. O. (1948.) **The use of intramedullary pins in small animal fractures. A preliminary report.**—*N. Amer. Vet.* 29. 292-297. 1918

B. records the treatment of 12 cases of bone fracture in the dog and cat by open reduction and insertion of steel pins into the medullary cavity

See also absts. 1903 (muscle degeneration); 1908 (ketosis); 1909 (mortality in piglets); 1962 (in Finland); 2027 (aseptic treatment of wounds); 2028 (control of animal epidemics).

POISONS AND POISONING

WHITE, I. G., BLOOD, D. C., & WHITEM, J. H. (1948.) **Arsenic poisoning in sheep.**—*Aust. vet. J.* 24. 331-334. 1919

Sodium arsenite (33 mg. per kg.) administered in solution by stomach tube was fatal in all cases. The only symptoms of diagnostic value were a fluid sound on ballottement of the abdomen and a gurgling sound on auscultation of the rumen. Macroscopic lesions P.M. included denudation of epithelium in the fore-stomachs and congestion of submucosal vessels in the abomasum. Death appeared to be due to an acute general toxæmia rather than to peripheral circulatory failure.

—D. C. BLOOD.

STEWART, J. L. (1947.) **The toxicity of phenanthridinium 1553 for cattle in the Gold Coast.**—*Vet. Rec.* 59. 462. 1920

Up till April 1947, 566 cattle and 100 pigs had been prophylactically inoculated with the drug, at 2 mg. per kg. in a 1% solution, without any toxic manifestations. Owing to abnormal drought conditions, however, the growth of grass was delayed from April to June, 1947. Stocks of hay and straw were exhausted by May and the cattle had to undergo severe conditions.

During May phenanthridinium toxicity began to appear, beginning with constipation followed by lachrymation, salivation with mouth lesions and a mucoid nasal discharge. Ulceration of the eyelids progressed to corneal opacity and photosensitization was apparent except where death intervened. The incubation period varied from 6-9 weeks. Out of 140 animals inoculated during March-April 1947, 78 were affected in various degrees and 44 of these died. On P.M. examina-

under nembutal anaesthesia. The age of the subjects ranged from eight weeks to one and a half years and the bones involved were femur (eight cases), tibia (three cases) and mandible (one case). Pins varied in length from 2-9 in. and in diameter from one-sixteenth to five-thirty-seconds of an inch according to the size of the medullary cavity.

They were inserted by a pin handle. These cases were treated with penicillin for three days, but this may not be necessary in some cases.

No additional support is used and the pins are removed about three weeks after operation. The limb is used soon after operation and the patient does not interfere with the pin. The extension of the method to other bone fractures is suggested. There are ten radiographs.

—E. J. H. FORD.

tion, emaciation, icterus of tissues, inflammation of the mucosa of the alimentary tract, haemorrhages of the heart and an enlarged and friable liver were fairly constant lesions.

S. considers that the abnormal drought conditions predisposed to this toxic manifestation, for although drinking water was adequate, natural grazing was very scarce and no artificial forage was available. The severity of the effects was directly proportional to the privations endured. Animals which did not die, however, recovered very quickly when grass became available locally.

S. decided to halve the dose to 1 mg. per kg. and not to attempt treatment again under drought conditions.—MALCOLM WOODBINE.

SLADE, R. E. (1945.) **Specific poisons.**—*Endeavour.* 4. 148-153. 1921

Recent advances concerning specific poisons are described with special reference to weed killers of the methoxone (2-methyl-4-chloro-phenoxy-acetic acid) type and to the insecticide gammexane (benzene hexachloride). The toxicity of the different isomers of benzene hexachloride was studied, a chronic condition being caused in rats by feeding small daily doses for several weeks. Results indicate that small quantities can be got rid of without any ill effects, even after two months of treatment. No effects on the skin were observed after painting twice daily with an emulsion containing 5% of the mixed isomers for 14 days. The mode of action of gammexane is not clear, but because of the similarity of its structure, gammexane may take the place of meso-inositol in the metabolism of the cell. Meso-inositol occurs as a constituent in practically all

animal cells and is associated in its action with the vitamin B complex.—H. PAVER.

QUIN, J. I., & CLARK, R. (1947.) **Studies on the action of potassium monofluoroacetate (CH_3FCOOK) [*Dichapetalum cymosum* (Hook) Engl.] toxin on animals.**—*Onderstepoort J. vet. Sci.* 22. 77-90. 1922

The toxic principle of the plant "gifblaar" was identified as potassium monofluoroacetate.

A synthetic product was variable in its toxicity towards different species; there was some indication of development of tolerance in mice; the route of administration made no difference to the toxicity in rabbits and g. pigs. In *in vitro* tests the toxic principle had no effect upon the activity of the ruminal flora of healthy sheep.

P.M. examination revealed signs of heart failure with generalized cyanosis and venous congestion. Perfused rabbit heart, rabbit heart *in situ* and sheep's heart *in situ* all, after a latent period, had typical symptoms of heart block suggestive of interference with the cardiac conducting mechanism.—R. MARSHALL.

EMMEL, M. W. (1947.) **The toxic principle of the species *Aleurites*.**—*J. Amer. vet. med. Ass.* 111. 386-387. 1923

The residual meal after extraction of oil from the seeds of *Aleurites fordii* (tung tree) was toxic to cattle and poultry. Two toxic principles were extracted:—a saponin and a substance which could be extracted with hot 95% ethyl alcohol. The toxicity due to the saponin decreased during storage of the meal up to five months and could be destroyed by hydrolysing with hydrochloric acid under pressure. By hydrolysis and extraction with 95% alcohol, a meal was produced which could be fed up to 20% of the diet to chicks

See also absts. 1893 (ground-nut cake); 1895 (wheat offals).

without harmful effects or retardation of growth.

—R. MARSHALL.

CUNNINGHAM, I. J. (1947.) **Photosensitivity diseases in New Zealand. V. Photosensitization by St. John's Wort (*Hypericum perforatum*).**—*N.Z. J. Sci. Tech. Sect. A.* 29. 207-213. [For part IV, see *V. B.* 16. 279.] 1924

Sheep and cattle grazing pastures heavily infested with St. John's Wort (*H. perforatum*) develop symptoms of photosensitization of exposed, unpigmented skin and extreme hyperaesthesia to touch or to contact with water. No jaundice or anatomical abnormality of the liver occurs. Mortality is low, but loss of condition and damage to the skin occur. An additional symptom of poisoning is the acute and violent convulsions which occur during the fording of streams or the dipping of sheep; the necessity of rescuing animals from drowning makes these operations arduous and costly.

In feeding experiments with sheep it was found that the weed is toxic in the dried, powdered state as well as in the fresh green state. In white sheep not exposed to sunlight, and black sheep exposed to sunlight no toxic effects were apparent. Convulsions in the dipping bath in sheep photosensitized by dosing dried, powdered *H. perforatum*, and by intravenous injection of eosin, erythrosin and rose bengal, were found to be associated with lesions in which the photosensitized skin surface was broken. The economic importance of poisoning by *H. perforatum* and its control and prevention are discussed briefly.

Hypericum androsaemum which grows widely throughout New Zealand, but which does not appear to be eaten by stock, was found by feeding experiments to have no toxicity for sheep.

—J. B. SWAN.

PHARMACOLOGY AND GENERAL THERAPEUTICS

(For treatment of specific infections see under the appropriate disease)

HAVINGA, E., JULIUS, H. W., VELDSTRA, H., & WINKLER, K. C. (1946.) **Modern development of chemotherapy.** [Monograph on the progress of research in Holland during the War.] pp. 175. New York & Amsterdam: Elsevier Publishing Co., Inc. 15s. 1925

This book provides an interesting account of the work done in Holland during the war, which was partly independent of that done in other parts of the world. Like many other workers the authors cannot accept the theory that the sulphonamides act solely by inhibiting *p*-aminobenzoic acid but they do believe that there is some very special relationship between these substances which requires further investigation. The order of

increasing activity of the sulphonamides was the same as the order of increasing adsorption of the drugs by bacteria, and *p*-aminobenzoic acid was more strongly adsorbed by bacteria than any of the sulphonamides. The authors found that Ca ions inhibit the action of the sulphonamides, but that the red cells of the horse contain a substance activating sulphanilamide even in great dilution.

In *in vitro* tests the relative activities of the following drugs sulphanilamide, sulphapyridine, sulphamerazine and sulphathiazole were found to be 1, 30, 40, 75 respectively against *Bact. coli*; 1, 3, 2, 4.5 respectively against streptococci; 1, 6, 6, 70 respectively against staphylococci and 4:4'diaminodiphenyl sulphone against *B. coli* 7.5.

These results appear to support the view that sulphathiazole is especially potent against staphylococci, and the fact, noted by FRANCIS [see *V. B.* 18. 268] that, compared with the heterocyclic sulphonamides, sulphanilamide is much less potent against *B. coli* than against streptococci. They also show that 4:4'diaminodiphenyl sulphone is less potent than the heterocyclic sulphonamides against *B. coli*, but no data are given for the action of this drug against streptococci.—J. F.

FLESCH, P., & KUN, E. (1948.) **Action of acetylcholine, histamine and cholinesterase inhibitors on isolated ileum in relation to its survival time.**—*Proc. Soc. exp. Biol., N.Y.* 69. 166-169. 1926

Strips of ileum from 20 g. pigs, 12 rabbits, 18 rats and nine fowls were immersed in oxygenated Tyrode's solution. They were repeatedly subjected to the action of constant, sub-maximal doses of histamine, acetylcholine and three choline esterase inhibitors. Initially histamine and acetylcholine-induced contractions were additive, no matter which was added first. After two and a half to three hours' survival the reactivity changed markedly for histamine, but only slightly for acetylcholine and choline esterase inhibitors. The addition of a previously effective dose of histamine no longer augmented an initial contraction induced with acetylcholine although the reverse procedure still gave augmentation. In rat, rabbit, and fowl gut, histamine alone no longer elicited contractions although acetylcholine did. Control pieces of ileum from the same animals were maintained in Tyrode's solution without drugs. When the reactivity of experimental strips was observed to change, then the control strips were subjected to the same test and found to give the same result as other strips. This is taken as indicating that the changes are due to *in vitro* survival and not to the prior administration of drugs.

By the incorporation of atropine in the Tyrode's solution the action of acetylcholine and the anti-cholinesterases was blocked. After two and a half to three hours' survival in the atropinized saline this block began to fail and the tissue responded to the stimulant drugs.

The implications of these results are discussed in relation to general pharmacological work, and in particular to the cholinergic theory of histamine action on smooth muscle.

Details of amounts of each drug used are given.—R. J. FITZPATRICK.

BELL, F. R. (1948.) **Alloxan diabetes in sheep.**—*J. comp. Path.* 58. 152-159. 1927

The intravenous injection of a 5% solution of alloxan at the rate of 200 mg. per kg. body weight

into adult blackface sheep, caused death within 24 hours, lethargy, prostration, convulsions and coma being produced. Polyuria with glucose and ketones in the urine, and hyperglycaemia followed by a terminal hypoglycaemia were also noted. Doses of 80-100 mg. per kg. bodyweight regularly produced a hyperglycaemia with death within 90 days.

There appeared to be no impairment in the clearance of blood glucose by the kidneys and no lesions were observed in animals which died from acute poisoning. With small doses, the main findings were fatty degeneration of the liver and an absence of liver glycogen. It was not possible to demonstrate any specific lesion in the beta-cells of the islets of Langerhans. It appears, however, that the drug has the same action in ruminants as in non-ruminants and that the intermediate carbohydrate metabolism of sheep is similar to that of non-ruminants.—J. A. NICHOLSON.

STECK, W. (1948.) **Intratracheale Penicillin-spülung beim Pferd. [Intratracheal injection of penicillin in horses.]**—*Schweiz. Arch. Tierheilk.* 90. 647-655. [Author's English summary copied *verbatim*.] 1928

Intratracheal injection of small amounts of penicillin in a considerable quantity of liquid (200000 or 100000 Oxford units dissolved in 200 c.c. of physiological saline) given once daily for a few days, appeared to have a marked influence on the course of bronchopneumonia in horses.

The same treatment did not seem to influence cases of catarrhal bronchiolitis and had but a slight effect on acute pharyngitis and strangles.

LOEWE, L., SOBEL, A. E., & ALTURE-WERBER, E. (1949.) **New penicillin products for sustained effects.**—*J. Lab. clin. Med.* 34. 67-73. [Authors' summary copied *verbatim*.] 1929

Prolongation of serum penicillin levels were observed in rabbits and human beings following single subcutaneous or intramuscular injections of formaldehyde-treated protein penicillin preparations. Significant sustaining and enhancing effects were noted following the administration of the insolubilized protein penicillin complexes or crystalline Na penicillin "G" suspended in Tween 20. The mechanism of this property of Tween 20 was investigated. Measurable penicillin levels were obtained in human subjects up to twenty-four hours following ingestion of a single dose of penicillin gel, alone or in combination with Tween. Further studies are in progress with the ultimate objective of developing practical penicillin sustaining and enhancing products for subcutaneous, intramuscular, and oral use in human beings.

BELLAMY, W. D., & KLIMEK, J. W. (1948.) **The relation between induced resistance to**

penicillin and oxygen utilization.—*J. Bact.* 55. 147–151. [Authors' summary copied *verbatim.*] 1930

A penicillin-resistant variant of *Staphylococcus aureus* has been obtained which grows more slowly than the sensitive, parent culture. This resistant variant has lost the ability to grow anaerobically. Strains of *Streptococcus faecalis*, *Streptococcus mastitidis*, and *Clostridium welchii* when treated in a similar manner failed to develop significant resistance to penicillin. From these data it is suggested that organisms that depend upon anaerobic processes for their energy supply will not develop appreciable resistance to penicillin.

PRATT, R., & DUFRENOY, J. (1948.) **Cytochemical interpretation of the mechanism of penicillin action.**—*Bact. Rev.* 12. 79–108. 1931

Micro-organisms which actively absorb O_2 and evolve CO_2 are most sensitive to penicillin. At bacteriostatic concentrations penicillin inhibits O_2 uptake and CO_2 release. Penicillin tends to enhance dehydrogenation in penicillin-fast organisms. An organism may be assumed to be penicillin-sensitive when penicillin stimulates dehydrogenation of its functional sulphhydryl groups faster than they can be restored. Decreasing the rate of H transfer or making extraneous-SH groups available nullifies the effect of penicillin. Increasing the rate at which H_2 becomes accepted by oxygen transporters or donors potentiates the effectiveness of penicillin.

—W. R. BETT.

WIEN, R., HARRISON, J., & FREEMAN, W. A. (1948.) **Diamidines as antibacterial compounds.**—*Brit. J. Pharmacol.* 3. 211–218. 1932

A study of the antibacterial properties of the diamidines indicated that Gram-positive bacteria were more susceptible to these substances than were Gram-negative bacteria, this antibacterial activity being maintained in the presence of blood. In ascending series of diphenoxyalkanes from the propane to the nonane derivatives, there was a graded increase in activity against staphylococci: this increase was accompanied by an increase in intravenous toxicity (mice), but by only a relatively small increase in local toxicity to phagocytes. The halogen derivatives of the diamidines increased further the bacteriostatic effect against *Staphylococcus aureus*, as well as against *Bacterium coli*, *Proteus vulgaris* and *Pseudomonas pyocyanea*; there was little alteration in local toxicity, however. Dibromopropamidine and iodoexamidine had bacteriostatic and bactericidal effects which appeared to be due to inhibition of the oxidative metabolism of bacteria. The bacteriostatic effect of diamidines was decreased in an acid medium and increased in an alkaline medium, only small

differences in pH being of marked significance. Permanently drug-resistant strains of bacteria could readily be produced by repeated subcultivation *in vitro*: a diamidine-resistant strain, although resistant to other diamidines, was sensitive to penicillin, and a penicillin-resistant strain was sensitive to diamidines, suggesting that these dissimilar substances have different modes of action.—CLIVE BRIGGS.

MARCENAC, N., BORDET, R., & JAUDIN, M. (1948.) **Anesthésie générale au pentothal. [General anaesthesia by pentothal.]**—*Rec. Méd. vet.* 124. 49–53. 1933

A general account of the subject. No new material.—G. V. LAUGIER.

HASS, G. M., & TAYLOR, C. B. (1948.) **A quantitative hypothermal method for the production of local injury of tissue.**—*Arch. Path.* 45. 563–580. [Authors' summary copied *verbatim.*] 1934

Local permanent inactivation of tissue can be produced rapidly and quantitatively by instruments cooled to a low temperature by expansion of carbon dioxide.

Two types of cooling elements have been used. One is flat and circular, so that when it is applied to the surface of an organ or tissue discrete cylindric lesions are produced. The diameters of lesions can be varied from 2 to 25 mm. by using cooling elements of comparable diameters. The depths of lesions can be varied from 1 to 13 mm. by varying the time during which the flat circular surface of the cooling element is in contact with the tissue. The second type of cooling element is a needle which can be inserted into tissue. Lesions produced by this instrument are cylindric. The diameters of lesions may be varied from 2 to 12 mm. and the depths from 2 to 35 mm.

The volumes of injured tissue are sharply defined and can be accurately measured. Lesions similar in quality, location and dimensions can be successively reproduced in the skull, the brain, the heart, the liver and the kidneys.

Necrosis of cells is uniform throughout the lesions, and there is sharp demarcation between nonviable and viable cells at the periphery. Inter-cellular matrices are surprisingly well preserved. Haemorrhage, if it occurs, is capillary in type, spontaneously controlled and restricted to the volume of injured tissue. Suppuration does not occur. Healing of lesions is slow but otherwise uncomplicated.

Organs and tissues can be topographically inactivated in a controlled quantitative manner which is not possible by use of methods such as hyperthermal cauterization, vascular ligation or surgical excision.

FAHLBERG, W. J., SWAN, J. C., & SEASTONE, C. V. (1948.) **Studies on the retention of hexachlorophene (G-11) in human skin.**—*J. Bact.* 56. 323-328. [Authors' summary copied *verbatim.*] 1935

Hexachlorophene (G-11) has been recovered from skin 2 days after three consecutive daily 6-minute applications of 1 per cent solution in liquid soap. Approximately ten times less hexachlorophene was recovered from skin following the use of a 2 per cent preparation in solid soap. One per cent aqueous zephiran chloride exhibited no prolonged residual bacteriostatic effect on the skin. Preliminary treatment of skin with acetone and ether increased and prolonged the bacteriostatic effect of hexachlorophene in the skin. The effect of whole serum in reducing the bacteriostatic effect of hexachlorophene could be

See also *absts.* 1722 and 1723 (mastitis); 1728 (anthrax); 1729-1733 (tuberculosis); 1756 (abortion); 1760 (tetanus); 1767 (actinomycosis); 1777 and 1778 (trypanosomiasis); 1783 (trichomoniasis); 1786 (coccidiosis); 1791 (piroplasmosis); 1873 (schistosomiasis); 1880-1883 (anthelmintics); 1904 (folic acid); 1920 (phenanthridinium); 2022 (introduction to pharmacology and therapeutics); 2026 (ABC of sulphonamide and antibiotic therapy).

PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

WELD, C. B. (1948.) **Fat absorption and lung oil.**—*Canad. J. Res. Sect. E.* 26. 274-282. 1937

Frozen sections of lung from dogs, cats, g. pigs and monkeys stained with sudan IV and haematoxylin revealed intracellular sudan-staining granules and interstitial or intravascular oil globules. These were more numerous in animals absorbing a fatty meal and, in a considerable number of these, patchy areas of oil were found that resembled pulmonary fat embolism. This appearance was not due to a histological artefact nor to the aspiration of oil. Lung fat determinations gave higher values than the normal range only when excessive oil deposits were present. Higher values were obtained from g. pigs than from cats, dogs and rabbits.—R. GWATKIN.

COMAR, C. L., & DRIGGERS, J. C. (1949.) **Secretion of radioactive calcium in the hen's egg.**—*Science.* 109. 282. 1938

Using Ca^{45} , one mg. of CaCl_2 with activity of $15\mu\text{c}$. [micro-curies] was administered as a solution into the lower oesophagus of three fasting hens. The elimination of this Ca^{45} in the shell, white and yolk of all eggs laid during the subsequent 20 days was estimated. Methods comprised wet and/or dry ashing of material with final precipitation of Ca as oxalate, the activity of which was measured with a Geiger-type counter.

One egg laid within 15 min. of administration contained a detectable amount of Ca^{45} in the shell, but not in the yolk or white. A large amount [$>80\%$ of the total dose] was present in the shell of eggs laid within 24 hours, but the amount

duplicated by egg albumin or serum globulin. COTTAM, C., & HIGGINS, E. (1946.) **DDT and its effect on fish and wildlife.**—*J. econ. Ent.* 39. 44-52. 1936

Applications of from 0.2-5 lb. per acre of D.D.T., were made, chiefly by aeroplane, in a number of geographically different areas of the U.S.A. Careful observations were made of the effects upon birds, fishes, mice, etc., as well as upon the insects for which control was sought. Invertebrates and cold-blooded vertebrates were more susceptible than birds and mammals. A spray concentration of less than two lb. per acre appeared to be safe for birds and mammals, and of less than 0.5 lb. per acre to avoid damage to fishes, crabs and crayfish, but the authors recommend that ponds and rivers should not be sprayed.

—R. MARSHALL.

present in subsequent shells fell very rapidly to a basal level of one-half *per cent.* of the total dose by the fourth day. The amount of Ca^{45} in whites was greatest in first-day eggs and fell nearly as rapidly as with the shell values. In yolks only a little activity was detected in 24-hour eggs, but this was followed by a rise to a peak in third-day eggs after which the amounts declined less rapidly than with values for whites. The total amounts in whites, yolks, and shells of all eggs laid were respectively 0.2, 0.7, and 40 % of the total dose. From this and other data the authors consider that up to 60-75 % of egg-calcium comes directly from ingested calcium.—R. J. FITZPATRICK.

DURAN-JORDA, F. (1948.) **The eosinophil cell. Studies in horse and camel.**—*Lancet.* 255. 451-452. 1939

In support of his theory of the genesis of the erythrocyte the author (1945) examined camels' blood and reports that the granules of the eosinophile are elliptical in this animal. This, he contends, supports his theory that the erythrocyte is derived from the eosinophile granule because camels' erythrocytes are elliptical.

—J. A. J. VENN.

REID, G. (1948.) **A pharmacologically active substance in serum and platelets which stimulates the suprarenal medulla.**—*Aust. J. exp. Biol. med. Sci.* 26. 107-121. [Author's summary copied *verbatim.*] 1940

In the serum of the cat and in extracts of the buffy coat of horse blood there is a diffusible, relatively heat-stable substance which, when injected into the arterial supply of the suprarenal

gland of the cat, causes an increase in blood pressure and heart frequency and contraction of the denervated nictitating membrane. These effects are due to the liberation of adrenaline from the suprarenal gland. The active substance acts directly on the cells of the medulla and not through the preganglionic fibres.

The activity cannot be attributable to histamine, potassium, adenyly compounds, tyramine, or a choline ester. There is no evidence so far to indicate that it is a substance other than the muscle-stimulating substance of serum and platelet extracts.

BARDACH, M., GORET, P., & JOUBERT, L. (1948.) Le système physiologique du tissu conjonctif et sa stimulation par le sérum de Bogomoletz. [The reticulo-endothelial system and R.E.S. anti-serum].—*Rec. Méd. vét.* 124. 337-363. 1948

A review is given of the physiology of the reticulo-endothelial system with a description of the method of preparation and some applications of the reticulo-endothelial system antiserum of Bogomoletz. This antiserum is prepared by using bone marrow as antigen. Injection of the antiserum is said to stimulate the activity of the reticulo-endothelial system and thus to be of therapeutic value in various diseases.—W. M. H. LAMBERT, P. S. (1948.) The development of the stomach in the ruminant.—*Vet. J.* 104. 302-310. 1942

Detailed histological studies of bovine embryos show that the four compartments of the ruminant stomach develop from the simple dilatation of the primitive gut so that the development of the ruminant stomach in no way differs from that of any other mammal.

In the 80 mm. ox embryo, the rumen is cylindrical and lies dorsal to the oesophagus. The reticulum lies to the left and slightly dorsally, between the rumen and omasum. It appears as a hemispherical bulge. The omasum lies posteriorly and ventrally and is broader than any of the other compartments. The abomasum is somewhat flask-shaped and runs posteriorly and dorsally to the omasum.

The oesophageal groove is formed of two folds running on either side of the cardia. These are covered by stratified squamous epithelium and end abruptly at the omasum. The omasal sulcus is represented by two folds of the epithelium projecting downwards from the omasal roof.

In the embryo, the oesophagus ends where the stomach-spindle begins and no compartment of the stomach originates from the oesophagus. It follows, therefore, that the term "oesophageal groove" is a misnomer and the term "gastric canal" is suggested as being more correct.

The formation of the greater and lesser omenta is comparable to their formation in any other animal with a simple stomach.—J. A. N.

INGRAM, I., & MCGAUGHEY, C. A. (1948.) Microflora of the rumen of the sheep. [Correspondence].—*Nature, Lond.* 162. 533-534. 1943

As a result of a study of the morphology and growth characteristics of the chief organism isolated from the rumen of sheep which appears similar to that termed *Schizo-saccharomyces ovis* by Quin, the authors could find no evidence that the organism is in fact a *Schizo-saccharomyces*, nor any evidence that such an organism is present in the rumen of sheep in Great Britain. They consider, therefore, that the term is misleading and should be discontinued.—J. A. NICHOLSON.

NELSON, V. E., GREENWOOD, D. A., & HEWITT, E. A. (1947.) The effects of the fluorides and chlorides of the alkaline earth compounds on respiration and blood pressure in the dog.—*N. Amer. Vet.* 28. 528-530. 1944

The following compounds were investigated: calcium fluoride and fluoro-silicate, barium chloride and fluoride, strontium chloride and fluoride.

Strontium fluoride proved to be the most active pharmacologically as 0.001 g. per kg. body weight arrested aspiration and caused a profound fall in blood pressure. Barium chloride was less active, exerting a primary stimulating effect and a secondary depression on both respiration and blood pressure. The other compounds were active only in much higher concentrations.

—A. T. PHILLIPSON.

FRIEDMAN, M., & BYERS, S. O. (1948.) Observations concerning the causes of the excess excretion of uric acid in the Dalmatian dog.—*J. biol. Chem.* 175. 727-735. 1945

It is well known that the Dalmatian dog possesses the ability of converting uric acid to allantoin and that its liver contains as much adenase, guanase and uricase as in dogs of other breeds. The cause of the excess secretion of uric acid by the Dalmatian must, therefore, be sought in the kidney.

The blood concentration and excretion of uric acid and allantoin by two Dalmatians was compared with that of the non-Dalmatian but no evidence of accelerated purine metabolism was found, the total purine excretion being very similar in the two types of dogs. It was found, however, that the Dalmatian excreted endogenous uric acid at the same rate as creatinine. This suggests that uric acid is a glomerular filtrate which is normally re-absorbed by the tubules, converted into allantoin and re-excreted. The kidney of the Dalmatian, however, does not possess

the power of absorbing uric acid through the tubules so that it appears in excess in the urine.

—J. A. NICHOLSON.

MOUSTGAARD, J. (1947.) **Variation of the renal function in normal and unilaterally nephrectomized dogs.**—*Amer. J. vet. Res.* 8. 301–306. 1946

Determinations of the renal plasma flow by means of the clearance rate of hippodin and the glomerular filtration rate by means of inulin clearance, were made in normal and unilaterally nephrectomized dogs. A comparison of the results showed that in the latter there was a considerable fall of both hippodin and inulin clearance which was followed by a more or less pronounced rise, the resting clearance rates becoming constant after some weeks. The marked decrease of renal function following nephrectomy is considered to be the consequence of the operation, combined with the effects of narcosis. The recovery may be ascribed to hyperaemia of the remaining kidney which now works with a higher glomerular filtration pressure or a larger filtration area.

—J. A. NICHOLSON.

CARLYLE, A. (1948.) **An integration of the total oxygen consumption of the sheep foetus from that of the tissues.**—*J. Physiol.* 107. 355–364. 1947

In order to check the foetal oxygen uptake previously determined by other methods, the oxygen consumption of tissue slices obtained from various foetal organs was determined and by addition of the results so obtained, the oxygen consumption of the whole foetus was then estimated for different ages. At 51 days of foetal age, the total oxygen uptake was found to be 5.2 ml. per min. per kg. which was in close agreement with the figure obtained by other methods. A decreasing oxygen consumption per unit body weight was found to occur with increasing body weight, the change being most likely due to progressive loss of tissue water, increase of inert material, change in body composition and a tendency in some tissues towards a lower oxygen utilization rate per unit dry matter.—J. A. N.

BARCROFT, J. (1946.) **The range of weights of foetal sheep at various ages.**—*J. Physiol.* 104. No. 3. 32P–33P. 1948

A figure shows the weights of sheep foetuses. At term, the weight ranged from 7.6 kg. down to 1.8 kg.; this great diversity appears only after the 130th day of gestation and the crown-to-rump length is not related to the weight. It is suggested that there is a failure in the growth rate in some foetuses, at least with regard to some of the soft tissues.—R. A. GREEN.

MOUSTGAARD, J. (1947.) **Om hormonal Kontrol af Maelkekirtelens Udvikling og Funktion.**

[Hormonal control of the development and function of the mammary gland.]—*Maanedsskr. Dyrlaeg.* 59. 10–31. [Abst. strictly from new material.] 1949

In addition to a review of recent advances a report is given on experiments to test the influence on milk yield of iodinated casein fed to lactating cows. A daily dose of 25 g. gave rise to an increase in yield of 25–30 %, 10–14 days after the first dose. The pulse and respiration rates were increased and the body weight fell. Data from metabolism tests are given, illustrating the increased metabolic rate as caused by the treatment. The administration of copper carbonate (0.5 g. daily) did not counteract the thyroid-stimulating effect of the casein, although it has been found that copper is antagonistic to thyroid extract. No complications from feeding iodinated casein were noted in these experiments, which were not greatly prolonged.

—J. E.

FOLLEY, S. J. (1947.) **Lactation: function and product. Endocrine control of mammary gland. I. Mammary development. II. Lactation.**—*Brit. med. Bull.* 5. 130–134; & 135–142. 1950

I. This is a concise but comprehensive review of experimental studies carried out in the last decade on the role of the hormones of the ovary, anterior pituitary, adrenal cortex, placenta and thyroid on the development of the mammary gland. While it is now well established that the ovarian hormones are the principal primary agents for evoking mammary development, it is still problematical whether they accomplish this through the agency of specific anterior-pituitary mammogens. The role of the placenta in mammary development is still obscure and most investigations on the problem are difficult to interpret since the workers concerned have overlooked the fact that most of the growth of the mammae occurs during the first half of pregnancy, whereas the apparent increase in gland size during the second half of pregnancy is largely due to an accumulation of secretion. The bibliography contains over 120 references.

II. In this review, recent studies on the endocrine control of milk secretion are considered. Much evidence is accumulating to support the belief that prolactin is not the only anterior-pituitary factor involved in the initiation of lactation in the suitably developed mammary gland, but it seems rather to be one of a group of factors forming a lactogenic-hormone complex of which another member appears to be adrenocorticotropin. These problems are discussed in detail, as are also the roles played by the anterior pituitary in the maintenance of established lactation and the relationship of the suckling stimulus to anterior-pituitary function. The exact roles of

the adrenal-cortex hormone complex are as yet not fully established, although the functional integrity of the adrenal cortex is necessary for normal lactation. While several theories have been put forward to explain the onset of copious lactation after parturition, careful consideration shows that these must be treated with reserve. A bibliography of some 150 references is provided.

—ALFRED T. COWIE.

FOLLEY, S. J. (1947.) **Lactation: function and product. The nervous system and lactation.**—*Brit. med. Bull.* 5. 142-148. 1951

Before discussing the relation of the nervous system to lactation, F. points out that much confusion has arisen in the past through failure to distinguish the several processes which together comprise the phenomenon of lactation. These processes are, first, the synthesis of milk by the cells of the alveolar epithelium, secondly, the passage of the milk from the cytoplasm of these cells to the alveolar lumen (these two sub-phenomena together make up "milk secretion" and thirdly, the discharge or the "let-down" and withdrawal of milk from the gland. No evidence whatsoever exists to indicate that milk secretion is under the control of secretory nerves, but the nervous system may participate in the control of lactation by affecting the blood flow through the udder, by affecting the rate of formation of certain hormones essential for milk secretion, and by controlling the withdrawal of milk from the gland. While there is little reliable information to consider about the control of the blood through the gland, the control of hormone secretion, in particular the hormones of the hypophyseal lactogenic complex by the suckling stimulus, has been dealt with in a comprehensive manner. F. has brought forward for consideration a great diversity of experimental data on the nursing stimulus, and the effects of spinal and hypophyseal stalk transection. The physiological processes involved in the ejection of pre-formed milk from the alveoli are reviewed. While there is considerable evidence that the alveoli are squeezed simply by some contractile mechanism which is controlled by the hormones of the posterior pituitary, the nature of the contractile mechanism, the so-called "myo-epithelial" cells, requires further investigation.—ALFRED T. COWIE.

YOUNG, F. G. (1947.) **Lactation: function and product. Experimental stimulation (galactopoiesis) of lactation.**—*Brit. med. Bull.* 5. 155-160. 1952

Y. reviews the experimental data on the use of anterior-pituitary extracts for stimulating milk production in the cow. The optimal dose would appear to be approximately 10 ml. extract, corre-

sponding to 2.5 g. fresh ox anterior-pituitary tissue, injected subcutaneously on alternate days over a period of 22 days. Increases in milk production were only obtained when the treatment was given during declining lactation, and while the increase in milk production easily covers the cost of the treatment, the very limited supplies of anterior-pituitary extract rule out the use of the method on a practical scale. On the other hand, thyroid-active iodo-proteins may become of great importance in dairy husbandry, for it has now been well established that iodo-proteins have a marked galactopoietic effect in the cow in declining lactation, and it only remains for long-term experiments to show the innocuousness of the treatment to the health of the animals.

—ALFRED T. COWIE.

MALPRESS, F. H. (1947.) **Lactation: function and product. Experimental induction of lactation.**—*Brit. med. Bull.* 5. 161-163. 1953

A study of the reports on the use of oestrogens to induce lactation in barren cows and heifers indicates that the method, because it gives varying and unpredictable results, cannot be recommended as a routine procedure, although in selected cases it may be of considerable value. M. considers that further advances in the solution of the problems involved depend on a better understanding of the quantitative interdependence of oestrogen and progesterone in mammary growth and of oestrogen and the pituitary lactogenic hormones in the control of milk secretion.—ALFRED T. COWIE.

ROBINSON, M. (1947.) **Lactation: function and product. Clinical treatment of hypogalactia by hormonal methods.**—*Brit. med. Bull.* 5. 164-166. 1954

R. recognizes four main types of hypogalactia in women. First, there is the co-called "sprinter", who secretes large quantities of milk during the first 2-4 weeks of lactation, but ceases to lactate about the sixth week; secondly, the "sticker", who produces sufficient milk for the baby during the first 2-3 weeks, but whose daily yield remains at a low level and is soon insufficient for the total requirements of the infant; thirdly, there is the "non-starter", who produces little or no milk at all, and lastly there are the women who are particularly susceptible to breast abscesses. Thyroid therapy in the early puerperium appears to benefit the "stickers" and the "non-starters". The "sprinters" and those liable to breast abscesses require intermittent treatment with oestrogens throughout lactation to prevent breast engorgement and reduce the risk of abscess formation. During oestrogen therapy the infant must be suckled as usual. Deformed and cracked nipples benefit from the application of 5% diethylstilboes-

trol in oil. Extracts of bovine anterior pituitary were not beneficial in hypogalactia in women.

—ALFRED T. COWIE.

BARNES, J. (1947.) **Lactation: function and product. Hormonal inhibition of lactation with special reference to man.**—*Brit. med. Bull.* 5. 167-170. 1955

B. reviews the literature dealing with hormonal therapy for prevention of breast engorgement and inhibition of lactation, and concludes that there is ample proof of the clinical value of oestrogens in preventing breast engorgement. Testosterone may also be used, but has no special advantage over the synthetic bestrogens.—A. T. C.

NICHOLS, J., & MILLER, A. T., Jr. (1948.) **Excretion of adrenal corticoids in the sweat.**—*Proc. Soc. exp. Biol. N.Y.* 69. 448-449. [Authors' conclusions copied *verbatim*.] 1956

There is a significant excretion of adrenal corticoids in sweat induced by exercise and thermal stimulation.

BROCHART, M. (1948.) **Présence de l'adrénaline dans le sperme des mammifères. [Adrenalin in semen of animals.]**—*C. R. Soc. Biol. Paris.* 142. 646. 1957

Adrenalin was demonstrated in samples of bovine, goat and human semen by a technique based on the reduction of arsenomolybdic acid. It exists in concentrations as high as 10^{-6} . This is in agreement with von Eulers' suggestion that adrenalin is secreted by the seminal vesicles and prostate of bulls.—ARTHUR W. MARRABLE.

COWIE, A. T., & FOLLEY, S. J. (1947.) **The role of the adrenal cortex in mammary development and its relation to the mammogenic action of the anterior pituitary.**—*Endocrinology.* 40. 274-285. 1958

Detailed studies of the mammary gland following adrenalectomy in the rat, provided little evidence that the adrenal cortex plays an essential role in the normal development of the mammary gland, only slight mammary regression being observed. Anterior pituitary extracts, however, were found to exert mammogenic effects both in the presence and absence of the adrenal cortex and gonads.—J. A. NICHOLSON.

HARRIS, G. W. (1948.) **Neural control of the pituitary gland.**—*Physiol. Rev.* 28. 139-179. 1959

Of all the endocrine organs, only the adrenal medulla and the neurohypophysis possess a rich nerve supply which influences their activity. It may be, however, that a general nervous control of the endocrine system is exercised through the hypophysis.

The neurohypophysis, *i.e.*, the neural lobe and stalk, receives a scanty sympathetic supply

from the carotid plexus and a main hypothalamic nerve supply *via* the neural stalk. It is concerned with the antidiuretic function of the pituitary which has been clearly shown to be influenced by emotional stress, the neural pathway being the supraoptico-hypophyseal tract. It is also directly concerned with parturition, an oxytocic factor being secreted at least in the rabbit and cat. Its pressor action is also well established. Direct stimulation of the hypothalamic nerve supply is followed by the characteristic pressor effect and the pressor factor rather than the oxytocic factor appears to be responsible for the increased peristalsis associated with posterior lobe activity. Whether one or more active substances are elaborated by the neurohypophysis is still uncertain.

The adenohypophysis, *i.e.*, pars distalis, pars tuberalis and pars intermedia, is also under neural control, but the evidence supporting the existence of a true secretory nerve is conflicting. It is well established that exteroceptive stimuli such as light, touch, sight, suckling, etc., may stimulate the release of the appropriate factor, but how this is brought about is uncertain. There is strong evidence that the hypothalamus is functionally linked with the anterior pituitary and hypothalamic fibres pass down the hypophyseal stalk. Section of the stalk leads to degeneration of these nerve fibres, but does not interfere with the activity of the gland. Following section, there is a rapid regeneration of the blood vessels and it has been shown that a true portal system of blood vessels exists between the pituitary and hypothalamus. It seems most likely, therefore, that neural control is exercised through humoral transmission. The nervous stimuli reach the hypothalamus which then releases some chemical agent which is carried by the portal system of blood vessels to the pars distalis where the blood is redistributed to all parts of the gland.—J. A. NICHOLSON.

DIEKE, S. H. (1948.) **The effect of removing various endocrine glands on the hair cycles of black rats.**—*Endocrinology.* 42. 315-319. 1960

In Norway rats, hair follicles become active in well defined areas of the body in definite sequence so that a new coat is acquired in a wave-like fashion, each complete wave of hair growth being called a hair cycle. It was found that thyroidectomy or hypophysectomy delayed the onset and completion of hair growth cycles and altered the sequence. Adrenalectomy accelerated the hair cycle but gonadectomy had no marked effect.—J. A. NICHOLSON.

PAUL, D. L. (1946.) **Judging of age by dentition in goats.**—*Indian Fmg.* 7. 133-135. 1961

P. states that in goats in India the first pair

of permanent incisors are cut at one year and three months, the second at one year and nine months, the third at three years and the fourth at four years and at four years and three months all the eight permanent incisors are in wear.

See also absts. 1891 (heat regulation); 1892 (ruminant digestion); 2000 (heat regulation); 2015 (oestrogens in plants); 2030 (blood reserves of animals, especially horses).

PUBLIC HEALTH, VETERINARY SERVICES AND VETERINARY EDUCATION

ANON. (1948.) Finlande. Services vétérinaires en 1943 et 1944. [Diseases of animals in Finland 1943 and 1944.]—*Bull. Off. internat. Epiz.* 29. 41-50. 1962

The State laboratory service supplies the 251 state veterinarians with sera, vaccines and tuberculins, about 16,000 doses annually, as well as carrying out bacteriological and chemical examinations. Short refresher courses for classes of half a dozen, lasting about three weeks, are held throughout the year. Contagious abortion is the most serious disease and spread badly during the war, 553 herds previously free being now infected. One thousand eight hundred and ninety-nine cattle died of "dysentery" and a sum of nine million marks was paid to the owners as compensation. Broncho-pneumonia of goats was also severe.

There are nine communal abattoirs, 39 co-operative abattoirs and three others. There are also eight poultry abattoirs.—R. MACGREGOR.

PATTON, J. W. (1948.) Veterinary education in Formosa and Japan. *Vet. Med.* 43. 149-151. 1963

P. was employed by U.N.R.R.A. for a short period in Formosa and gives an outline of the system of veterinary education in Formosa which had been under Japanese rule for 51 years.

There was a veterinary college as part of the Taihoku University and several secondary veterinary institutions. Outstanding graduates from the secondary institutes were sent to the University at Taihoku or sometimes to the Imperial University at Tokyo. There was a veterinary association with some 500 members. The common diseases included swine fever, swine plague, fowl plague [Newcastle disease?], rabies, infectious anaemia, and piroplasmiasis. These were well controlled and there was an efficient system of quarantine of imported livestock. Rinderpest had been eradicated. There was an institute at Tamsui for manufacture of vaccines and sera; this had been badly damaged by bombing, but was rebuilt.

Although there were enough well-trained technicians there was a great shortage of more highly trained veterinary officers following the departure of the Japanese supervisory staff.—M. C.

P. studied about 100 goats of different breeds such as the Assam, local Jamnapari, Bengal black and their crosses, both male and female and castrated males, the dates of birth of which were known.—M. K. SREENIVASAN.

YAMANE, J. (1948.) A veterinary education in Japan.—*Vet. Med.* 43. 152-155. 1964

There are three grades of veterinary education in Japan, namely at the Universities, the high schools and the middle schools. Entrance to the University is at about 17 years of age after a stiff entrance examination. In the Universities the veterinary section is part of the Faculty of Agriculture and graduates are given the degree of Master of Agriculture; the degrees of Master of Veterinary Science or Doctor of Veterinary Science formerly awarded have been abolished. Between 20 and 30 graduate from Tokyo University and ten from Hokkaido each year.

There are 12 higher schools which train about 30-50 technicians each year; these men are given licences to practise. The middle school graduates get a certificate of proficiency in veterinary aid.

Veterinary education in Formosa has been modelled on that of Japan and Y. gives details of the curriculum. It now suffers from a lack of competent teachers since the Japanese professors were repatriated.—M. C.

HOWELL, D. E., CAVE, H. W., HELLER, V. G., & GROSS, W. G. (1947.) The amount of DDT found in the milk of cows following spraying.—*J. Dairy Sci.* 30. 717-721. 1965

Selected cows, which were kept freely with untreated animals under normal dairy conditions, were sprayed with D.D.T. either in the form of diluted wettable powder or emulsion; D.D.T. was excreted in their milk. The recommended spraying technique of two quarts of 0.25% of D.D.T. in either form used every other week gave low concentrations of D.D.T. in the milk, while massive doses (5% of wettable powder in two quarts of water daily) raised the concentration up to as much as 38.6 p.p.m. Heavy spraying caused storage of D.D.T. in the body, since excretion in the milk continued for many weeks after cessation of spraying. Even the milk carrying the highest level of D.D.T. was not harmful to mice.

—R. MARSHALL.

CARTER, R. H., HUBANKS, P. E., MANN, H. D., ALEXANDER, L. M., & SCHOPMEYER, G. E. (1948.) Effect of cooking on the DDT content of beef.—*Science.* 107. 847. 1966

Cattle which had been fed upon hay containing D.D.T. were slaughtered and the meat prepared for standard cooking operations. Tests of roasting, broiling, pressure cooking, braising and frying indicated that D.D.T. in the meat (up to 20-30 p.p.m.) was not materially decomposed or lost during these processes.—R. MARSHALL.

GEURDEN, L., DEVOS, A., & DE VOS, N. (1949.) Bijdrage tot de studie van de pathogenese der vleesvergiftigingen veroorzaakt door *Salmonella*. [Meat poisoning caused by *Salmonella dublin*.]—*Vlaam. Diergeneesk. Tijdschr.* 18. 49-53. [English, French & German summaries. Abst. from summaries.] 1967

In investigations following a case of veal poisoning, *S. dublin* was isolated from the meat of twin calves, which had been slaughtered in *extremis* a few hours after birth. The agglutination

See also abst. 2031 (meat inspection).

test carried out on the patients yielded a positive reaction. Bacteriological examination of the faeces of the dam was negative, but the agglutination test was positive. The authors believe that the calves had become infected *in utero*.—E. G.

GUEST, G. H. (1948.) Precautions for workers using radioactive isotopes.—*Canad. J. comp. Med.* 12. 323-333. 1968

The hazards and precautions that must be taken when working with radio-active isotopes were discussed. G. described laboratories and equipment especially designed for the purpose, when amounts greater than those used as tracers were involved. Auxiliary equipment and services, such as instruments used to check the presence of radio-active material, film monitoring, clothing, cleanable surfaces, and disposal of radio-active waste materials were also discussed.—P. J. G. P.

LIVESTOCK HYGIENE

INGLIS, J. S. S., & ROBERTSON, A. (1949.) Hygienic aspects of pig housing. A review.—*Vet. Rec.* 61. 141-145. 1969

This useful critical review emphasizes the lack of precise information concerning the optimum environmental conditions of pig houses. The authors stress the conflict of opinion concerning such matters as optimum temperature, air flow and cubic space, and they consider that detailed investigation into the different aspects of the relationship between housing and health in pigs is urgently needed.—D. LUKE.

GUNN, C. K. (1948.) Canada. Dominion Experimental Fox Ranch, Summerside, P.E.I. Progress report results of experiments 1936-1946. pp. 85. Ottawa: E. Cloutier. 1970

This report covering work done during a period of ten years forms almost a short manual on breeding, feeding, housing and parasite diseases of foxes. The vaginal smear technique for detection of oestrus, the relation of time of mating to size of litter, examination of semen by taking samples from the vagina after copulation,

and the process of fertilization in foxes have been studied. An account is given of a lethal type of anaemia occurring in mutant platinum fox pups, the condition occurring in both the Norwegian and the Quebec mutant strains. The anaemia is probably the result of a hereditary factor.

Anaemic foxes could be cured by feeding a diet containing liver and supplemented with vitamins A, B, C, D & K and iron. The food was minced and strained to facilitate healing of the haemorrhagic intestinal mucous membrane. It was found necessary to administer iron to the cubs during the suckling stage.

Dried egg is not an efficient substitute for fresh meat in the diet of fox cubs as it is deficient in biotin and the colour and condition of the fur is adversely affected.

D.D.T. in powder form gave good results in control of fleas and had no ill effect on the fur nor on the health of the foxes. D.D.T. was of no value in destroying hookworm larvae on the floors of fox pens. Phenothiazine was readily eaten by foxes when mixed with the food, but was not efficient against ascarids and hookworms.—M. C.

REPRODUCTION AND REPRODUCTIVE DISORDERS

LASPALLES. (1947.) De l'insémination artificielle dans la détermination des sexes chez la jument. [Artificial insemination of mares and sex determination.]—*Rev. vét. milit.* 2. 138-142. 1971

Twelve mares were artificially inseminated using a stallion common to ten control mares served normally. A preponderance of females in the artificially inseminated mares was observed.

In the control mares, six males and four females were born against only two males and 11 females in the experimental mares. Temperature changes were observed between collection of semen and insemination. It is concluded that the male sperm factor is inhibited by repeated sudden temperature changes and by prolonged storage (up to six hours) at a constant temperature (10°-22°C.).

[This evidence is hardly conclusive on so small a number of pregnancies.]-G. V. LAUGIER.

DUMAS. (1948.) *Considérations sur l'insémination artificielle des grandes espèces domestiques (relation d'un voyage d'études en Haute-Autriche). [Artificial insemination of large domestic animals.]-Rev. vét. milit. 3. 149-158. 1972*

Two artificial insemination centres in American Occupied Austria are described. The centre at Pettenbach is under veterinary supervision, and a routine examination of mares and cows is made prior to insemination and, if necessary, sterility treatment is given. A complex semen diluent is employed and storage up to six days is effected in thermos flasks at 5°-6°C. below normal air temperature to obviate a sudden change in temperature when the semen is used. A simple glass tube bent at right angles is used to introduce the semen into the cervix and injection effected by blowing down the tube, four ml. being used in mares, one ml. in cows. Results over a period of ten years, are 80% successful in mares, and over four years are 88% successful in cows. All operations at the centre are checked daily, records are kept, the farmers being provided with a record sheet.

The A.I. centre at Wels, for cattle only, is run by the U.S. Military Command. Here, results are poor—55% successful. The diluent is a simple citrate solution. Results are thought to be due to absence of veterinary supervision and insemination without prior examination.

Out of 1,000 pregnancies the proportion of males to females was about equal [see also previous abst.]-G. V. LAUGIER.

SCHILL, F. G. (1948.) *Equine insemination, pro and con.-N. Amer. Vet. 29. 413-417. 1973*

This paper by a practising veterinarian deals with various aspects of the application of artificial insemination to horse breeding.

Amongst the advantages is that of disease control, particularly by reducing the risk of spread of streptococcal infection and also by detecting by clinical examination malformations of the genitalia. The greater use that can be made of a stallion's semen increases the income of its owner.

The method may fall into disrepute owing to its performance by persons lacking the necessary training and proper equipment. There is grave danger of the spread of streptococcal and coliform infections by contaminated semen. Often proper semen assays are not made and advantage is not taken of frequent insemination during oestrus.

The attitude of certain American breed societies is discussed.—E. J. H. FORD.

LUDWICK, T. M., OLDS, D., & CARPENTER, M. (1948.) *A method of evaluating bull semen.—*

J. Dairy Sci. 31. 677. [Authors' abst. copied verbatim.] 1974

Samples of diluted semen were incubated at 100°F. and observed under the microscope at regular intervals until motility ceased. Observations were made on data summarized from the Kentucky Artificial Breeding Association and cover a period of 11 months. The observations include 305 ejaculates from 27 different bulls of the Holstein, Jersey and Guernsey breeds from which approximately 12,000 cows were bred.

The coefficient of correlation between incubation time (time for sperm to lose all activity when held at 100°F) and conception rate (based on 60-90 day non-returns) was 0.84 ± 0.03 when only ejaculates which were used in the breeding of as many as 30 or more cows were included. Ejaculates which were used to breed only a few cows did not give good correlations.

SOBEK, V. (1949.) *Odběr semene pro umělé osemenování. [Collection of semen for artificial insemination.]-Čas. československ. Vet. 4. 132-136. 1975*

A conventional account of methods and apparatus used in artificial insemination.

GREEN-ARMYTAGE, V. B., SILBERSTEIN, F., & WACHTEL, G. E. (1947.) *Influence of semen on the female reproductive organs.-J. Obstet. Gynaec. 54. 324-339. 1976*

Clinical observations on the size of the vagina and uterus of virgin women and the same after several months of married life indicated that semen may have some effect upon the growth of the genitalia. The authors carried out experiments upon rabbits, by injecting human semen intravenously and intraperitoneally. They concluded that heterologous semen has a marked effect upon the genitalia both macroscopically and histologically. A considerable number of experimental animals failed to respond. In other experiments using boar semen the active principle of semen was found to be insoluble in acetone, but soluble in benzene.

In experiments on mature and ovariectomized rabbit does the injection of homologous spermatozoa indicated strongly the effect of semen upon the size and physiological condition of the uterus, litter mates being used as controls. The positive results were of two kinds, stimulation of ovaries and retardation of follicular growth.

Whether there is a factor present in the spermatozoa producing these results is not clear, and whether such a factor is necessary for the final ripening and enlargement of the female sex organs is not known, although this hypothesis appears to be favoured by the authors.—A. W. MARRABLE.

BÖNNER, G. (1947.) *Reducing power of human*

spermatozoa in relation to fertility.—*Klin. Wschr.* 24-25. 756-757. [Abst. in *Brit. Abstr. A.III.* July. 655. (1948), copied *verbatim*. Signed: M. D.-K.] 1977

1 c.c. of ejaculate, mixed with 10 c.c. of gelatin-glucose solution and 1 c.c. of methylene-blue solution (1:20,000), are kept in a thermostat at 40° until complete decoloration occurs. If this occurs in 3.5-4 hr., normospermia and normal fertility are present; decoloration in 4-10 hr. indicates oligospermia, not excluding fertility; oligospermia with a decoloration time of 10-12 hr. is resistant to therapy. There is azo-ospermia if no decoloration is observed after 12 hr. Necro-spermia is proved by entire lack of decoloration. The results depend on the presence of H_2 , produced from glucose in the anaerobic metabolism of living sperms by the action of intracellular enzymes which reduce methylene-blue to leuco-methylene-blue.

SALISBURY, G. W. (1949.) Some aspects of reproductive efficiency in cattle.—*N. Amer. Vet.* 30. 20-24. 1978

This is a general discussion based on feeding trials with bulls and analysis of artificial insemination records.

The protein requirements of bulls over five years of age are met by a concentrate mixture containing 12% vegetable proteins and the total ration is provided by 0.46 lb. concentrates and 1 lb. hay per 100 lb. live weight per day. Vitamin A deficiency produced incoordination and inability to mount before semen changes were noted.

In young bulls there was a depression of semen production during the warm summer months and old bulls had a period of low fertility during winter.

A study of artificial insemination records indicated that young heifers had a conception rate of 88-85% compared with that of mature cows, although the heifers conceived better to bulls of their own age than to older bulls. Young cows conceive most readily in spring and autumn and old cows best in spring and summer.—E. J. H. F.

ROWLANDS, I. W., & HANCOCK, J. L. (1948.) Anterior pituitary hormones and the oestrous cycle.—*Vet. Rec.* 60. 181-185. Discussion pp. 185-186. 1979

The general properties of two gonadotropic hormones of pituitary origin, one causing follicle stimulation (F.S.H.) and the other luteinization (L.H.) are briefly mentioned and emphasis is laid upon the relation of the hormones to ovulation. F.S.H. produces initial growth of follicle, but does not of itself usually cause ovulation. L.H. given in the correct dose at the correct stage of follicle growth will facilitate final maturation and ovula-

tion. Overdosage with F.S.H. does not speed up follicle growth, but may cause cystic follicles to form.

The sources and the actions of oestradiol and progesterone are reviewed. Their action on the follicle is problematical, that of oestradiol being a stimulation of maturation of granulosa and that of progesterone being an inhibition of maturation by depressing L.H. formation in the pituitary.

H. describes the oestrous cycle of the bitch with details of the recognition of its phases: pro-oestrus about nine days, true oestrus about nine days, and metoestrus about 80 days. Emphasis is laid upon vaginal smear changes. Only small follicles are present in pro-oestrus, but at transition to oestrus they enlarge and ovulation begins on the day of the first acceptance and continues for several days. Normally acceptance ceases about seven days after ovulation. Ova remain viable two days or more and spermatozoa have a long survival period within the bitch. Mating is recommended on the first and third days of true oestrus. To produce oestrus in anoestrous bitches oestrogens are not recommended since they produce the manifestations of oestrus without stimulating the pituitary to initiate ovulation.

The use of F.S.H. and L.H. preparations is dangerous since the level of endogenous secretion in such bitches is unknown, and overdosage is easily produced. H. suggests a series of divided doses of F.S.H. as the best method. L.H. is not given since the endogenous secretion is presumed to be adequate.

For the termination of manifestations of oestrus in troublesome bitches H. recommends the intravenous administration of 200 I.U. of chorionic gonadotropin. He cites one case in which this was effective, for two successive oestrous periods, the effect occurring eight days after injection. This hormone is also recommended for cystic ovaries and for pyometra in virgin bitches, associated with cystic ovaries.

The technique for vaginal smears in bitches is given, Giemsa or methylene blue staining being recommended.

Variations of pro-oestrus are considered, and for cases in which repeated pro-oestrus times were of 2-4 days duration, a course of 200 I.U. of an L.H. preparation was recommended to cause maturation and ovulation. L.H. was also recommended for cases of undescended testes in dogs by virtue of its stimulatory action on the cells which formed androgens. The use of stilboestrol to prevent conception is presumed by Hancock to aim at preventing implantation, by action on the surface of the uterus, and that a much smaller dose repeated in three days would prevent conception by retaining the ova in the fallopian tubes.—R. J. F.

ASDELL, S. A., DE ALBA, J., & ROBERTS, S. J. (1946.) **The levels of ovarian hormones required to induce heat and other reactions in the ovariectomized cow.**—*Rep. N.Y. St. vet. Coll.*, 1944-45. pp. 78-84. Reprinted from *J. Anim. Sci.* 4. 3. (1945). 1980

The average dose of oestradiol benzoate required to induce oestrus was found to be 600 rat units \pm 178 rat units; this was determined by increasing the daily dose given to ten ovariectomized heifers by 75 r.u. per day and then averaging the dosage for the three days previous to oestrus. In two cases complete failures to induce signs of oestrus were recorded even with doses up to 5,000 r.u. daily: the heifers were run with a bull with a painted brisket to ensure that a brief oestrous period, possibly at night, would not be missed. It was noted that the heifers which responded at the lower levels of dosage were those in which the signs of oestrus were most obvious.

The average dose of stilboestrol required to induce oestrus was determined from tests on four animals and found to be 668 r.u. or 0.225 mg. daily.

High daily doses of oestrogen failed to produce continuous oestrus and it appears that an "oestrous block" occurs in the central nervous system. At doses above 5,000 r.u. daily no mucin is discharged from the vagina and this appears to be due to excessive keratinization of the vaginal wall.

No oestrogen could be detected in the urine of cows in oestrus brought about by oestradiol injection.

The level of progesterone needed to bring about the reactions peculiar to this hormone was estimated with drugs on the motility of uterine muscle, according to the method of Cupps & Asdell (1944): it was found to be between 18 and 36 rabbit units daily for six days. The effects of the treatment of the cows on the length of uterine muscle cells are given in a table.

The low thresholds for effective action of the gonadotropic hormones are discussed in relation to the length of pre-ovulatory periods; and the corresponding values for man, horse, pig and sheep, the length of the periods, the threshold oestrogen level and the excretion of the hormone during oestrus appear to be positively correlated.

The freemartin condition is discussed in relation to the low hormone threshold of the cow.

—G. L. BAILEY.

HARRISON, R. J. (1948.) **The changes occurring in the ovary of the goat during the estrous cycle and in early pregnancy.**—*J. Anat.* 82. 21-48. 1981

A detailed description, illustrated by four plates, is given of ovogenesis, follicular growth, and corpus luteum development in the ovaries of

non-pregnant and pregnant goats. Polynuclear ova and polyovular follicles, seldom reported in the ovaries of ungulates, are found in animals in pro-oestrus and in oestrus, also in early pregnancy. Four phases of development of the corpus luteum are described and are related to the development and activity of the placenta.—W. R. BETT.

CRAFTS, R. C. (1948.) **The effects of estrogens on the bone marrow of adult female dogs.**—*Blood*. 3. 276-285. 1982

Large doses of oestrogens are very toxic to the bone marrow of the adult dog, which responds to injections with a great increase in the neutrophils in the marrow. These are released into the blood, causing marked leucocytosis. Subsequently there is destruction of the white cells and erythroid elements in the marrow and replacement by "oedema". Injections of 10 mg. of oestrogen per day produced no such changes in monkeys. There are no indications that human beings respond in this manner.—W. R. BETT.

EAST, J., UNDERWOOD, E. J., & BENNETTS, H. W. (1949.) **Oestrogenic effects of subterranean clover (*T. subterraneum* L. var. *Dwalganup*): protective action of androgen in the castrate male.**—*Aust. J. exp. Biol. med. Sci.* 27. 105-118. 1983

Experiments were carried out to determine the effect of androgen treatment of castrated male g. pigs and wethers fed on subterranean clover capable of producing the breeding disturbance in ewes described previously [see *V. B.* 17. 322]. The work was stimulated by the observation that entire male sheep were unaffected by the clover.

Testosterone propionate injected intramuscularly completely prevented the development of oestrogenic effects in wethers although in control sheep receiving no androgens there were characteristic changes. A similar but incomplete protection was observed in g. pigs given similar injections of testosterone. The action of the androgen was more marked in protecting against changes in male secondary sex organs than against the growth of nipples.

Similar tissue changes occurred in g. pigs consuming potent clover and controls receiving a normal diet plus injections of stilboestrol.

—D. C. BLOOD.

HISAW, F. L., & ZARROW, M. X. (1948.) **Relaxin in the ovary of the domestic sow (*Sus scrofa* L.).** *Proc. Soc. exp. Biol.*, N.Y. 69. 395-398. [Authors' summary copied *verbatim*.] 1984

No relaxin is found in the ovaries of the gilt nor of the sow during the follicular phase of the estrous cycle. There is, however, 2.5 to 5 G.P.U. [g. pig units] of relaxin per gram of ovarian tissue present during the luteal phase of the cycle. The

amount of relaxin in the ovaries increases rapidly during pregnancy and reaches a maximal concentration of approximately 10,000 G.P.U. per gram of tissue by the time the fetuses attain a length of 5 or 6 inches. The blood at mid-pregnancy contains 2 G.P.U. per ml while the placenta has 0.5 to 2.5 G.P.U. per gram.

ASDELL, S. A. (1949.) **Nutrition and the treatment of sterility in dairy cattle: a review.**—*J. Dairy Sci.* 32. 60–70. 1985

Reviews the literature on the effects of general malnutrition, mineral and vitamin deficiencies, and the effects of overfeeding on reproduction in dairy cows.—A. G. SINGLETON.

MÜLLER-LENHARTZ. (1947.) Beziehungen zwischen Ernährung und Unfruchtbarkeit der Milchtier. [Nutrition and sterility in dairy animals.]—*Dtsch. tierärztl. Wschr.* 54. 175–176. 1986

An increase in sterility in cows in recent years is attributed to the use of large quantities of concentrates in the diet. Protein of high biological value in legumes of hay and pasture is utilized for milk production and little amino-acid is eliminated, while the protein of concentrates, particularly if not of mixed botanical origin, may be relatively less utilized and more eliminated, a process associated, according to the author, with diminished reproductive activity. Unbalanced mineral composition in concentrates furthers the bad effect upon reproduction. Increasing the legume content of the food with increased milk production is advocated.—R. MARSHALL.

LESBOUYRIES, G. (1948.) Stérilité de la vache. [Sterility in cows.]—*Rec. Méd. vét.* 124. 385–411. 1987

A comprehensive review on sterility in cattle, its causes and treatment. Sterility in granular vaginitis is considered to be purely mechanical, and easily overcome by infusing warm water into the vagina prior to service. L.'s conclusions are of interest. It appears that in France, veterinary advice is not usually sought until sterility becomes a herd problem. The chief causes apart from brucellosis and trichomoniasis are classed as neuro-hormonal imbalances due to high protein feeding and phosphorus deficiency in calcium rich soils. Enucleation of the corpus luteum and rupture of cysts are regarded as being of little value apart from the benefit derived from massage effects. L. speculates on the possible effect of stilboestrol on human beings if it is excreted in the milk. Artificial insemination in relation to sterility is discussed.—G. V. LAUGIER.

SYKES, J. F. (1949.) **Methods of approaching the problem of infertility.**—*J. Dairy Sci.* 32. 92–95. 1988

The need for defining terms and for some generally accepted index of fertility is discussed. Immediate problems for co-ordinated experimental investigation in the fields of physiology, pathology, genetics and nutrition are suggested.

—A. G. SINGLETON.

CHAMBERS, E. E. (1948.) **Penicillin in the treatment of nonbreeding cows.**—*N. Amer. Vet.* 29. 640–641. 1989

Multiparous cows having oestrus at regular intervals often failed to conceive following repeated service. Rectal examination revealed a slightly enlarged uterus lacking in tone which C. believed to indicate low-grade uterine infection.

These cases were treated by intra-uterine infusion of 200,000 units of penicillin in 15 ml. of water. No records were kept, but the first five cases treated by the above method conceived at the next service and C. considers that the method is 90% effective.—E. J. H. FORD.

KINGMAN, H. E. (1948.) **Bull problems.**—*N. Amer. Vet.* 29. 89–94. 1990

K. deals with the clinical aspects of infertility in the bull and the points to note in determining the fitness of a bull for service.

The importance of general health is stressed, particularly affections of the skeleton, hind limbs and feet. The treatment of injuries to the penis and scrotal hernia is discussed. Vitamin A deficiency is important as a cause of functional sterility. Semen examination and assessment are considered at length.—E. J. H. FORD.

MORLEY, F. H. W. (1948.) **Some seasonal factors affecting fertility among Merino ewes in the Trangie District of New South Wales.**—*Aust. vet. J.* 24. 106–111. 1991

Records available from the Merino stud at Trangie Experiment Farm were analysed to investigate the economics, for that district, of lambing in different seasons. From a study of these it would appear to be possible to increase the number of lambs at weaning by 20–30% by lambing in September. The usual practice was to lamb in March–April when a greater number of lambs were born. Poor seasons and heavy grass seed infestation are the objections to September lambing.

November lambing resulted in a decline of 30% in fertility (as compared with September lambings). This was brought about by fewer ewes lambing and by a marked decrease in the incidence of twins. Difficulty was also experienced in mothering lambs [*i.e.* inducing the ewes to accept and to suckle their lambs] on account of high environmental temperatures. Greater losses in ewes due to pregnancy toxæmia were also recorded.

Variation in individual ram performance was considerable. This may have been due to semen quality or to differences in vigour and technique of rams.

In discussing lamb mortality it is pointed out that the first week following mothering is of great importance. Well shaded, fenced and watered paddocks next to the mothering yards are of supreme value. Deaths amongst twins were more frequent than amongst single lambs. The elimination of twins could be accomplished by mating at times when fewer twins were being produced. This would probably result in a lower lambing percentage, since records from 1942-47 have shown a close relationship between lambing percentage, percentage of ewes lambing, and percentage of multiple births. It would therefore probably be better to aim at higher lambings and to endeavour to improve conditions for survival and growth of twins.

There appeared to be no difference between the proportion of ewes detected in oestrus during autumn and spring. It is considered that in Merino sheep, changes in the level of ovarian activity are not necessarily reflected by changes in the incidence of oestrus but may be expressed by marked differences in the proportion of multiple births and the proportion of ewes lambing.—C. S. SAPSFORD.

BRITTON, J. W. (1947.) **Clinical studies on early equine abortion.**—*Cornell Vet.* 37. 14-20. 1992

Observations are made based on breeding records of several studs of thoroughbred mares.

Early abortion is that condition where oestrus occurs more than 30 days after service or where oestrus does not occur but no foal is produced the following year. The biological pregnancy test at 45 days and rectal examination at 90 days are usually positive. Possible causes of the condition include defective ova or spermatozoa, abnormal vulvar anatomy, genital infection, particularly following service at the foaling heat, and systemic disease.

The importance of sexual rest as a method of treatment is stressed.—E. J. H. FORD.

GILMORE, L. O. (1949.) **The inheritance of functional causes of reproductive inefficiency: a review.**—*J. Dairy Sci.* 32. 71-91. 1993

The inheritance of low fertility, developmental abnormalities which affect reproduction, and lethal factors in cattle, are reviewed.—A. G. S.

BERGER, J., & INNES, J. R. M. (1948.) **"Bulldog" calves (chondrodystrophy, achondroplasia) in a Friesian herd.**—*Vet. Rec.* 60. 57-58. 1994

The pathology, pathogenesis and genetics of this condition in Dexter cattle and in man are

briefly reviewed. An account is then given of its occurrence in a dairy herd of Friesian cattle with case histories of the cows and results of P.M. examination of one of the "bulldog" calves. The pedigrees of the cattle concerned are not given and there is no discussion of the mode of inheritance.—M. C.

STENIUS, P. I. (1946.) **Tre fall av hjärtmissbildning hos kalv. [Three cases of deformed heart in calves.]—*Skand. VetTidskr.* 36. 385-400. [English and Swedish summaries.] 1995**

S. describes cardiac malformations found P.M. in three Swedish Red and White heifer calves which died at 14, ten and 14 months respectively without any preliminary symptoms.

Findings in all three cases are given in detail following a brief review of the condition in animals and in man from the literature. The left chamber was in all cases shrunken, the right chamber dilated, being in one case 3-4 times as large as the left. In the third case there was transposition of the aorta to the right chamber without any septum defect, which S. considers very unusual.—F. E. W.

INNES, J. R. M., ROWLANDS, W. T., & PARRY, H. B. (1949.) **An inherited form of cortical cerebellar atrophy in ("daft") lambs in Great Britain.**—*Vet. Rec.* 61. 225-228. 1996

Lack of precise knowledge of the neuropathology of domestic animals causes confusion in diagnosis, and cases are cited in which swayback has been wrongly diagnosed.

"Daft lamb" disease has been identified in Wales, Scotland, Northumberland, and Yorkshire, and may be widespread but unrecognized. Affected lambs may be unable to stand, or may succeed in walking with gross incoordination. The disease appears definitely to be hereditary. Histopathology revealed a form of cortical cerebellar atrophy; the original should be consulted by those interested in neuropathology.—G. B. S. HEATH.

HESTON, W. E., & DERINGER, M. K. (1948.) **Hereditary renal disease and amyloidosis in mice.**—*Arch. Path.* 46. 49-58. [Authors' summary copied *verbatim*.] 1997

These studies on the nephritis and amyloidosis that occur in mice of the high nephritis strains A and Y and low nephritis strain L and in their hybrids confirm Dunn's suggestion that the two conditions are associated, the amyloidosis preceding the nephritis. Both genetic and non-genetic factors are demonstrated to be causative agents. Segregation of genetic factors was evident in the F₂ and strain A back-cross generations. The occurrence of some nephritis, although of low incidence, in the genetically homogeneous groups of strain L and the F₁ hybrids resulting

from crossing strain L with strain A was evidence of the influence of nongenetic factors.

Outstanding among the nongenetic factors was a chronic dermatitis caused by the mite *Myobia musculi*, and that resulted in secondary amyloidosis. The secondary amyloidosis in turn resulted in nephritis.

Segregation ratios in the F_2 and back-cross generations suggested that the primary amyloidosis and the resulting nephritis were caused by a single recessive gene. Final conclusions, however, must await the results of breeding tests of back-cross or F_3 segregants.

These results suggest the desirability of studies in search of a genetic factor as the causative agent of primary amyloidosis in man.

BECK, J. D. (1948.) **Behaviorism a factor in a**

See also absts. 1782 and 1783 (trichomoniasis); 1847 and 1848 (jaundice in foals).

case of suspected impotency.—*Vet. Ext. Quart. Univ. Pa.* 48. 10-11. 1998

Failure to serve cows may in some cases be due to a change in environmental circumstances. A bull is cited which failed to serve cows when loosed with the herd, but did so when handled and allowed to serve them individually. This peculiarity of behaviour was found to be due to the bull's training by a previous owner.—A. W. M.

FORBES, T. R. (1947.) **The crowing hen: early observations on spontaneous sex reversal in birds.**—*Yale J. Biol. Med.* 19. 955-970. 1999

This is an interesting, and in places amusing, account of folk lore and scientific literature dealing with sex reversal in fowls and other birds from the earliest times up to 1900 with a bibliography of 93 references.—M. C.

ZOOTECNHY

KENDALL, S. B. (1948.) **Relationship between breed of cattle and ability to maintain a constant body temperature under tropical conditions.**—*Vet. J.* 104. 112-115. 2000

Observations on the rectal temperatures of a mixed herd of Friesian, grade Friesian and zebu dairy cows at Dar es Salaam are recorded. Temperatures were taken at 5.30 a.m. and 2.30 p.m. with the animals at rest in an open shed after grazing on a pasture with light shade from palm trees. The morning atmospheric temperature averaged 68.6°F. with a relative humidity of about 94% and the afternoon temperature 80.6°F. with a relative humidity of about 62%.

The morning rectal temperatures ranged from 101.2°-102.3°F. in the zebu and from 101.1°-102.1°F. in the Friesians. The afternoon temperatures were from 101.4°-102.9°F. in the zebu and from 101.8°-103.1°F. in the Friesians. Individual cows among the Friesians varied considerably in the difference between their afternoon and morning temperatures. It is suggested that such individual variations indicate scope for selective breeding of cattle of European breeds adapted to a tropical climate.—M. C.

BONSMMA, J. C. (1948.) **Increasing adaptability by breeding.**—*Fmg S. Afr.* 23. 489-452. 2001

B. deals with adaptation of various breeds of cattle to a South African environment.

Factors which are of importance in determining the suitability of cattle to this environment include their reactions to temperature, radiation and humidity, their ability to find grazing and to utilize fodder, their resistance to parasitic diseases and to such conditions as photosensitization, epithelioma of the eye, and keratosis of the skin. An ability to avoid toxic plants is also important.

The kinds and colour of hair and skin which are resistant to solar radiation and to heat are described and illustrated. A white, yellow or red hair on a black skin is considered the ideal combination for hot climates. Black hair does not reflect or filter heat or light rays but it does reflect ultra-violet rays. Heat and ultra-violet rays are reflected by black skin. Black breeds are therefore adapted to high altitudes where short-wave radiation is intense; they are said to thrive well in sub-tropical areas provided they are not exposed for long periods to the direct rays of the sun. Cattle which have primary hair follicles in the skin are said to have better developed sweat and sebaceous glands and so are thought to be better able to lose heat as a result of evaporation. Furry coated cattle cannot lose heat effectively. Such cattle have both primary and secondary hair follicles. A thick skin with a good blood supply favours loss of heat by radiation. Measurements of hair thickness of various breeds are given; hair of Afrikaner cattle was thicker than that of Shorthorns. The heat tolerance coefficient of cattle increases with age. The birth weight of calves of unadapted breeds in a hot climate is much lower than normal. The mortality rate of Afrikaner cattle as compared with cattle of exotic breeds on a farm infected with heartwater was much lower over a period of ten years, so low indeed that immunization of that breed was not justified; the losses as a result of immunization could be as high as those from natural infection in unprotected Afrikaner cattle.—M. C.

KOTHAVALLA, Z. R., & LAZARUS, A. J. (1947.) **The preparturient milking of dairy animals.**—*Indian J. Vet. Sci.* 17. 52-58. 2002

An investigation was carried out for three

years on 24 Sindhi cows, and 40 Sindhi, 16 Gir and 20 cross-bred heifers to determine the merits of preparturient milking. The animals, with the exception of Sindhi heifers, were divided equally between the control and treatment groups. The treatment consisted in massaging the udders 3-4 times a day from about a month prior to the due date of calving. Milking was started as soon as the udders began to fill up, which happened usually 10-15 days before calving. The calves in the treatment group were fed the milk drawn from their respective dams; no separate colostrum was fed as "it was the intention to observe incidentally the effect of the preparturient treatment on the offspring".

In the premilked cows the average annual milk yield (average of over three years) rose from an initial 3,554 lb. to 3,862 lb. as compared with 3,554 lb. to 4,105 lb. rise in the controls. In the premilked heifers, the Sindhis gave on an average 2,360 lb.; the Girs 2,304 lb. and the cross-breeds 4,677 lb. *per annum*. The respective average yields of the controls were 2,526 lb., 2,943 lb., and 5,710 lb. The "treatment did not increase the milk yield to an extent which justified the extra cost involved" and "the calves of cows subjected to treatment invariably failed to thrive as well as the controls". In both the treated cows and heifers, there was retention of placenta.

No recognized statistical tests were employed in the treatment of the data.—S. S. PRABHU.

STODDARD, G. E. (1948.) **Observations on calves dehorned with an antimony trichloride-salicylic acid-collodion preparation.**—*J. Dairy Sci.* 31. 693. [Author's abst. copied *verbatim*.] 2003

More than 60 calves have been dehorned with solutions containing antimony trichloride as the escharotic, salicylic acid as an analgesic, and flexible collodion as the carrier. Two solutions containing 28 and 38 per cent, respectively, of antimony trichloride, a commercial preparation containing an undisclosed amount of antimony

trichloride, and stick caustic potash were compared. The 38 per cent solution being more viscous, was easier to apply with a minimum of spreading. It also formed a firm film more rapidly, reducing the time required for application. The solution was applied by an eye-dropper with a spatula-shaped tip. The three solutions and caustic potash were about equally effective. The caustic potash was very irritating, whereas the calves dehorned with the antimony trichloride solutions showed no apparent pain during application. After about an hour, some exhibited a slight irritation, as shown by the shaking of their heads. The amounts required ranged from 1 to 2 g., with the smaller amounts used for the small horn buttons. The area covered should be kept to a minimum, covering only the button elevation. The amount necessary to remove the horn from some calves has been found to cause excessive swelling on others. The Guernsey calves seemed more resistant to escharotic action than did the Holstein, Ayrshire, Jersey and Brown Swiss calves.

The preparations were effective for calves between the ages of 3 and 10 days, but results were best at 3 to 5 days. Calves have been successfully dehorned at ages up to 17 days, but earlier treatment is recommended. The dehorning operation with the antimony trichloride solution took about twice as long as with caustic potash. Initial trials on dehorning kids have proved unsuccessful with all escharotics used.

RIPPER, A. (1948.) **A crush for the tuberculin testing of cattle.**—*J. agric. W. Aust.* 25. 259-262. 2004

R. describes a crush designed for tuberculin testing of cattle which are not used to handling. The crush permits of suitable restraint, access to the animal and the use of a head bail, and is also suitable for dehorning, vaccination and branding.

—D. C. BLOOD.

See also absts. 1725 (milking machines); 1961 (judging age of goats); 2032 (marking animals intended for slaughter).

TECHNIQUE AND APPARATUS

LENNARTSSON, T. (1948.) **En förenklad jäsningsmetod vid bakteriologisk diagnostik. [A simplified fermentation method for bacteriological diagnosis.]**—*Skand. VetTidskr.* 38. 305-310. [Abst. from English summary.] 2005

L. describes a method used for the bacteriological inspection of meat. Small hollows are made in a freshly solidified sugar free broth-agar plate 3-4 mm. thick, containing a suitable indicator such as brom-cresol purple. Small amounts of the respective solid sugars to be fermented are

placed in the hollows with about an equal amount of distilled water or blood serum. The bacteria are inoculated under the agar surface adjacent to the hollows.—E. G.

ACHORN, G. B., Jr., & SCHWAB, J. L. (1948.) **A method for the aeration of liquid cultures of microorganisms.**—*Science.* 107. 377-378. 2006

The passage of air at acoustic velocities through a fine orifice will produce large numbers of very small bubbles which cause violent agitation

and aeration of a liquid medium. Good results are obtained with an orifice sparger, which is easily cleaned and sterilized. The formula for calculating appropriate dimensions is given.

—A. M. BLOMFIELD.

MACULLA, E. S., & COWLES, P. B. (1948.) **The use of glycine in the disruption of bacterial cells.**—*Science*. 107. 376-377. 2007

A simple method is described of effecting the solution of the intracellular contents of bacteria by lysis with glycine. Using packed cells, the best yields were obtained with young cultures treated with ten times their volume of a glycine solution of one mol. concentration. Optimally, 85% of protein nitrogen could be extracted and nucleic acid and polysaccharides were also obtained.—A. M. BLOMFIELD.

KELNER, A. (1948.) **A method for investigating large microbial populations for antibiotic activity.**—*J. Bact.* 56. 157-162. [Author's summary copied *verbatim*.] 2008

A general method is described whereby large numbers of microbial colonies from diverse sources can be tested for antibiotic activity. Use of the method is illustrated by descriptions of experiments in which (1) a soil flora is tested for strains producing antibiotics against *Escherichia coli*, or *Staphylococcus aureus*; (2) a pure culture of a highly active actinomycete is tested for variants with increased activity; and (3) a soil flora is tested for strains inhibiting the germination of redtop [*Agrostis palustris*] seeds.

JASMIN, A. M. (1945.) **An improved staining method for demonstrating bacterial capsules, with particular reference to *Pasteurella*.**—*J. Bact.* 50. 861-863. 2009

See also absts. 1968 (isotopes); 2033 (methods in medical research).

A modification of the method of Hiss. Culture suspended in phenolized physiological saline containing 10% blood serum [species not mentioned] is spread on a slide, fixed in methyl alcohol, drained, flamed and stained with any of the usual bacterial stains.—L. M. MARKSON.

YEGIAN, D., & VANDERLINDE, R. J. (1947.) **The nature of acid-fastness.**—*J. Bact.* 54. 777-783. 2010

The authors put forward the theory that in Ziehl-Neelsen staining a small portion of the dye is absorbed by the cytoplasm, the remainder being held free in the cell unable to diffuse out again through the cytoplasmic membrane. It is this free dye which gives the stained bacillus its characteristic colour. They found that most of the dye in the bacillus can be precipitated and redissolved, and that this free dye can be removed by boiling water or 50% neutral alcohol without permanently altering the acid-fast property.

—L. M. MARKSON.

COUDERT, J., & BAUD, C. (1946.) **Procédé de montage des échantillons parasitologiques dans les verres synthétiques. [A method of mounting specimens of insects in plastics.]**—*Ann. Parasit. hum. comp.* 21. 177-182. 2011

Best results were obtained with the plastic methyl methacrylate. The object to be mounted is dehydrated in alcohol, passed through toluene and then into two changes of the pure monomer plastic. The procedures used for purifying the plastic before use, the immersion of the object in the plastic, and polymerizing the plastic to form the block, as well as the precautions necessary to obtain good results, are described in detail.

—L. DAVIES.

MISCELLANEOUS

TULLIS, J. L., & WARREN, S. (1947.) **Gross autopsy observations in the animals exposed at Bikini. A preliminary report.**—*J. Amer. med. Ass.* 134. 1155-1158. [Copied *verbatim* from abst. in *Bull. Hyg., Lond.* 22. 805-806. (1947). Signed: SYDNEY RUSS.] 2012

An atom bomb similar to that used at Nagasaki was exploded under conditions of control. No human being was damaged thereby but a number of animals (goats, pigs, guinea pigs and rats) were used as test agents. There were two explosions, one in the air, so-called test "Able" and one under water, called test "Baker". Under test "Able", the positions used for the placement of animals on the target ships covered the ship from masthead to below waterline; the protection against ionizing radiation varied from nil to

8 inches of steel armour plate. In the "Baker" test, there was minimal shielding from ionizing radiation. The authors state that the chief factor in the development of continued leucopenia is damage to the blood-forming organs.

There is a complete absence of any physical measurements of the gamma radiation which caused the death of these animals. It was not possible owing to wartime conditions at Nagasaki and Hiroshima, but in the planning that went with the Bikini tests it is surprising to find no relevant data from the physicists; they must have been present, for the article concludes:—"An underwater atomic bomb explosion is more lethal than an air explosion, since the spray which showers down on the ships in the vicinity carries with it fission products which contaminate their

surfaces, cannot be removed easily and remain dangerously radioactive for long periods of time". This action is caused by the intense outburst of gamma radiation at the moment of disintegration of the bomb.

The paper tells us little that could not be inferred from the wartime casualties at the two Japanese cities mentioned.

HARVEY, E. N., & McMILLEN, J. H. (1947.) An experimental study of shock waves resulting from the impact of high velocity missiles on animal tissues.—*J. exp. Med.* 85. 321-328. [Authors' summary copied *verbatim*.] 2013

The spark shadowgram method of studying shock waves is described. It has been used to investigate the properties of such waves produced by the impact of a high velocity missile on the surface of water.

The method can be adapted for study of behavior of shock waves in tissue by placing the tissue on a water surface or immersing it in water. Spark shadowgrams then reveal waves passing from tissue to water or reflected from tissue surfaces.

Reflection and transmission of shock waves from muscle, liver, stomach, and intestinal wall are compared with reflection from non-living surfaces such as gelatin gel, steel, plexiglas, cork, and air. Because of its heterogeneous structure, waves transmitted by tissue are dispersed and appear as a series of wavelets.

When the acoustical impedance (density \times wave velocity) of a medium is less than that in which the wave is moving, reflection will occur with inversion of the wave; *i.e.*, a high pressure wave will become a low pressure wave. This inversion occurs at an air surface and is illustrated by shadowgrams of reflection from stomach wall, from a segment of colon filled with gas, and from air-filled rubber balloons.

Bone (human skull and beef ribs) shows good reflection and some transmission of shock waves.

When steel is directly hit by a missile, clearly visible elastic waves pass from metal to water, but a similar direct hit on bone does not result in elastic waves strong enough to be detected by a spark shadowgram.

WOLFENBARGER, D. O. (1946.) Dispersion of small organisms. Distance dispersion rates of bacteria, spores, seeds, pollen, and insects; incidence rates of diseases and injuries.—*Amer. Midl. Nat.* 35. 1-152. [Abst. in *Rev. appl. Ent. Ser. B.* 36. 23. (1948), copied *verbatim*.] 2014

The distance to which organisms disperse is important in planning their control, and to provide quantitative information on the subject, the author analyses published data on the horizontal and vertical dispersion of small animate and inanimate objects. The results are shown on graphs relating the incidence of inanimate objects, plants (including fungi and bacteria), viruses and insects to the horizontal distance from the source, and of insects and micro-organisms (bacteria, fungi and pollen) to the height above it. Consideration of these indicates that dispersion may be initiated by internal factors, such as the reproductive impulse, hunger, periodicity of habit or gregariousness, or by external influences such as overcrowding, shortage of food, change of food conditions, quantity or quality of light, temperature and moisture conditions, wind, or the intervention of other organisms, and that the distances to which organisms disperse depend on the species, activity, generation or phase involved. A general discussion on horizontal and vertical dispersion includes notes on the direction of dispersion, migration (movements between localities in one or both of which breeding occurs), means and agents of dispersion, the effect on dispersion of density level at the source, and the relation of dispersion to the application of control measures. A few of the general problems involved in relating dispersion and incidence to distance are indicated.

REPORTS

AUSTRALIA. (1947.) Twenty-first annual report of the Council for Scientific and Industrial Research, for the year ended 30th June, 1947. pp. 139. Canberra: L. F. Johnson, Govt. Printer. 6s. Items of veterinary interest pp. 19, 20, 25-38. 2015

Extensive studies were made on the occurrence of *Str. agalactiae* MASTITIS in dairy herds. The organism was recovered from utensils and the surroundings of the cattle in very few instances. It was recovered from 46% of the teats in a herd in which hygiene was poor, and from 3% and 17% of the teats in herds in which hygiene was good.

Attempts to eliminate *Str. agalactiae* from herds were generally unsuccessful. Even simultaneous treatment of all quarters with penicillin failed to eliminate the organism in one herd, but was successful in another. A peculiar feature, frequently observed with *Str. agalactiae* isolated after exposure to antiseptics, including crystal violet, was again encountered: all strains isolated after treatments (penicillin, hypochlorite, trypanflavine), although reacting with group B precipitin test, failed to agglutinate with any of the type antisera, thus suggesting some injury to the mechanism which synthesizes the type substance.

The use of the complement-fixation test for diagnosing TUBERCULOSIS in cattle had been extensively studied. Adjustment of the diagnostic titre to a level necessary to minimize false positive reactions in animals free from the disease leads to a marked reduction in the number of tuberculous animals detected.

Vaccination with strain 19 vaccine prevented both infection and abortion. Causes of deterioration of vaccine were studied, and are enumerated.

Bacteriological studies on the classification of the *Cl. oedematiens* group were continued. All BLACK DISEASE strains were confirmed as belonging to Type B. A strain from "SWELLED HEAD" OF RAMS was of Type A. Toxic fractions of *Cl. welchii* were examined. There was no evidence that Type E occurs in Australia. The toxicity of epsilon toxin was increased by both pure crystalline trypsin and chymotrypsin.

Splenectomy of calves infected with *Haemobartonella bovis* was followed by an intense infection, with minor symptoms, and rapidly responded to penicillin.

Three distinct types of Gram-negative organisms capable of oxidizing arsenite to arsenate in the presence of oxygen were isolated from arsenical cattle dipping fluid.

For control of cattle tick, suspensions of D.D.T. at 0.5% concentration, as "rucide", have proved superior to arsenic in every respect except cost and ease of preparation. The chief advantages are absence of irritation, effectiveness against arsenic-resistant tick, and residual toxicity for 1-3 weeks. Suspensions remained active in dipping vats for more than a year.

In "cleansing" experiments it was found that dipping twice in suspensions containing not less than 0.35% D.D.T., with an interval of 3-6 days between dippings, will cleanse cattle efficiently, provided that the animals are in good condition and not grossly infested with ticks. Methods for chemical determination of the D.D.T. content of dipping fluids after varying periods, and with various degrees of contamination with dirt and faeces, have been developed.

Studies on toxicity of D.D.T. applied weekly in oily solutions to cattle, have run for 15 months. Treated cattle have not gained weight as rapidly as controls, but otherwise there are no ill-effects, and at P.M. examination of animals killed at the end of 12 months there was no detectable microscopic or chemical evidence of toxic effects. Calves were born to, and suckled by, treated cows without ill-effects. Milk samples examined contained 3-4 parts per million of the drug.

The "partial spraying" technique developed for the control of buffalo fly, *Siphona (Lyperosia)* in dairy cattle has proved successful for beef

cattle which are handled regularly, e.g., for dipping against ticks. Dipping cattle in D.D.T. against ticks results in local extermination of buffalo flies.

Observations on emulsions of D.D.T. used in dipping baths for sheep showed "stripping out", with reduced concentrations of the insecticide, as the number of sheep passing through the bath increased. Modifications were made to the dehalogenation technique of analysis.

Application of D.D.T. in concentrations of 0.1% either in a dipping bath or shower dip eliminated keds from newly shorn sheep and woolly lambs. Lower concentrations were effective in shorn sheep but not woolly lambs. A light infestation with body louse (*Damalinia ovis*) was eliminated by dipping in 0.1% D.D.T. Difficulties in keeping the foot louse (*Linognathus pedalis*) alive away from sheep, hampered studies on its bionomics. Observations on infested sheep gave the following:—Deposition of egg to hatching, 14-15 days; first stage larva to adult, 16-17 days; pre-oviposition, 5 days; egg to adult, 30-32 days; rate of egg production, 1 per day. Infestations declined somewhat in autumn and increased from early winter.

Sheep kept on a low plane of nutrition so that they gained 7 lb. in 12 months developed heavy infestations with ked and body louse, while similar sheep kept on a high plane of nutrition so that they gained 68 lb. in 12 months threw off the greater part of their infestations.

Studies on BLOWFLY STRIKE IN SHEEP confirmed the association between fleece-rot and body strike. Fleece-rot tended to occur in the same sheep in successive years.

Lamb-marking dressings containing boric acid, citronella and bentonite were highly effective in preventing strike in marking-wounds provided adequate quantities were applied—not more than 100 lambs being treated per gal. of dressing. By spraying the tail and crutch with approximately 2.5 ml. pure citronella oil, semi-natural citronella oil (i.e., oil from which most of the geraniol had been removed) or dibutyl phthalate, a considerable degree of protection was obtained.

Studies on *Lymnaea brazieri*, the intermediate host of *Fasciola hepatica*, were continued at the Regional Pastoral Laboratory at Armidale. It was found that it is the free Cu ion which is toxic for the snails. The effects of copper sulphate are soon lost in some waters by precipitation. This snail feeds largely upon desmids and diatoms. There is a well-marked oviposition period in late winter or early spring and a less well-defined, and much less extensive, period about mid-summer. Prolonged exposure to temperatures about freezing-point appear to be unfavourable for *L. brazieri* and none was found above 5,000 feet on

Mt. Kosciusko in mid-summer though favourable habitats were abundant.

Injection of small doses of phenothiazine into the rumen of sheep reduces egg production by *Haemonchus contortus* but does not necessarily destroy the worms. Egg production may return to pre-treatment levels after some days or weeks. The dose rate of phenothiazine must be maintained at high levels in order to secure a high degree of efficiency against *Trichostrongylus* spp. Phenothiazine administered as an enema against *Oesophagostomum columbianum* was less effective than when given by mouth, suggesting that factors other than concentration of the drug in the vicinity of the parasite are concerned in the efficiency of treatment. In sheep maintained in pens which excluded the possibility of reinfestation, larvae of *O. columbianum* continued to emerge from the bowel wall for as long as 12 months after the original infestation had become established. When sheep were fasted for 4-5 days egg production by *Trichostrongylus* spp., and to a less extent by *H. contortus*, was reduced. Sheep treated with phenothiazine had reduced appetite, but recovered within a week. Sheep fed a ration which resulted in increasing bodyweight threw off infestations with *H. contortus* in 6-43 days (mean 19 days) while those fed a ration which just maintained bodyweight threw off their infestations in 12-120 days (mean 57 days). When given a "test" dose of larvae the former group proved relatively resistant, while those in the latter group were highly susceptible.

The results of administering infective larvae of *H. contortus* to sheep already carrying an infestation were variable: sometimes the established infection is thrown off, but is soon re-established by adults developing from the dose of infective larvae; sometimes no reinfection occurs. Field observations indicate that similar phenomena occur naturally, and when the infestation is thrown off the phenomenon is referred to as "Self-Cure". Experiments have shown that sheep have no appreciable resistance to infection at the time "self-cure" is manifested and that the phenomenon is of very short duration. Present indications are that it is probably an anthelmintic effect rather than a form of immunity or resistance.

A further field trial confirmed the effect of grazing green oats during winter months on infestations with *O. columbianum*. The sheep which continuously grazed an oat crop thrived and soon threw off the greater part of their worm burden with this parasite; sheep grazing the crop for three hours each day, with access to natural pasture for the rest of the time, did not thrive nearly so well and did not throw off their infestations with *O. columbianum*.

Studies on helminth physiology and toxicology were continued. It was found that eggs, larvae and adults of *H. contortus*, *Nippostrongylus muris* and *Ascaridia galli* could utilize oxygen. The adult parasites used sugars for energy production, while larval forms were dependent on fat. Study of the localization of alkaline phosphatase in the cuticle of *Moniezia* spp. suggests that inhibitors of this enzyme should be toxic for the parasite. In two species of nematodes high demands for phosphate were observed. Phenothiazine inhibits an enzyme, acid phosphatase, in the parasite's tissue. Nematode parasites of sheep produce amines which may be toxic for the host.

A complement fixation test has been developed, using antigens prepared from *H. contortus* and *Trichostrongylus* spp., and is of considerable value in tracing changes in infestation in sheep. There is considerable cross reaction between these two species. Attempts to prepare antigen from larvae had not been successful. Lipoid fractions of adult worms appeared to be of importance in the complement fixation test, whereas polysaccharide fractions were more specific in skin tests.

Methods for estimating serum magnesium were being critically studied and there are notes on techniques for determination of serum inorganic phosphate. Field studies have begun to examine the effects on the control of RICKETS of providing massive doses of vitamin D (calciferol) for young sheep during winter months.

A fairly full review of the work on sheep nutrition of the Division of Biochemistry and General Nutrition is given. The chief studies dealt with nutrition and wool production, rumen digestion and absorption, energy metabolism, vitamin A, tissue respiration, cobalt and arginase, chronic FLUOROSIS, minor elements in relation to productivity of sheep and pastures.

Severe outbreaks of TOXAEMIC JAUNDICE IN SHEEP were associated with luxuriant growth of subterranean clover after early rains. Soil acidity favours the occurrence of the disease. Conditions which favour growth of herbage rather than grasses, also favour its occurrence. In some herbage plants there is a marked uptake of copper and a slight uptake of molybdenum and these seem to favour a high copper status in the sheep.

Administration of the antihistamine drug, "neoantigan", to sheep and horses which had gorged on wheat had no significant effect in preventing LAMINITIS.

Studies were made on the destruction and excretion of oestrogen and of oestrogenic substances produced by certain plants. Changes in bulbo-urethral glands, mammary gland, skin glands and prepuce of wethers on high and low

protein diets and given injections of hexoestrol were observed during a period of three months. Continued treatment with oestrogen failed to maintain mammary enlargement or skin gland activity. Wethers on the high protein diet quickly developed external ulcers on the prepuce which healed quickly in sheep given hexoestrol but persisted in control animals. Urine of wethers does not appear to be rich in gonadotropins.

In a study of effect of subterranean clover on the reproductive tract, dried subterranean clover was fed to virgin g. pigs and oestrogenic effects were recorded.

Studies of wool biology in two contrasting types of sheep, the Corriedale and the fine-wool Camden Park Merino, were continued. Responses of sheep to high temperatures and humidities were measured.

Animal breeding studies include the effect of diet on spermatogenesis in rams, inheritance of SKIN WRINKLES, POLLEDNESS, "HOLLOWBACK", "HAIRINESS" or "FLUFFY-TIP" and "PARROT MOUTH" in sheep, and the hereditary nature of a peculiar form of SKIN EPITHELIOMA in a strain of sheep. A survey of wool production is in progress. A number of breeding trials with different methods and different strains of sheep have begun. Observations on zebu hybridization were continued and extended to development of hybrid dairy cattle. Poultry breeding investigations have also begun at the field station at Werribee, Victoria.

Other investigations of veterinary interest include extensive work on pastures for sheep and cattle, weed control, drug plant investigations, life-cycle and bionomics of *Simulium* spp., insect physiology and toxicology, "activators" for fly-sprays, physiology of reproduction in sheep, haematuria vesicalis in cattle, administration of thyroxine to cattle, dairy research, meat preservation and transport.—H. MCL. GORDON.

AUSTRALIA, QUEENSLAND. (1948.) **Annual report of the Department of Agriculture and Stock for the year 1947-48.** Brisbane: A. H. Tucker. Items of veterinary interest pp. 51-66. 1946

In order to encourage veterinary practitioners to become established in country centres, contract tuberculin testing of cattle was organized by the Department of Agriculture and Stock.

To control buffalo fly, *Siphona* (*Lyperosia*) the principle of treating with D.D.T. all cattle travelling from infected regions into "clean" regions was applied with satisfactory results. "Strategic" dips were charged with 0.5% D.D.T. for the dual purpose of buffalo fly and cattle tick control.

A favourable season resulted in a great increase in the cattle tick (*Boophilus microplus*) population. Owing to the generally unsatisfactory

results of dipping in arsenical preparations a number of dips had been charged with D.D.T. (0.5%). Dipping in mixtures of D.D.T. and arsenicals was followed by serious mortality. Mobile spray plants were in use for control of ticks in isolated outbreaks.

The use of D.D.T. in "cleansing" dips has enabled much more expeditious movement of cattle from infected into "clean" regions. Chlordane showed considerable promise in preliminary trials. Numerous trials with D.D.T. and benzene hexachloride were carried out.

Promising results followed the feeding of cattle affected with WALLUM DISEASE with calcium and phosphorus supplements fortified with cobalt and copper. Regular provision of mineral licks containing calcium, phosphorus and limonite appears to control PEG-LEG DISEASE. A condition clinically resembling botulism occurs in the region affected by peg-leg disease.

A few cases of ATAXIA were reported in horses, many of which recovered. Purgation with arecoline and removal from the affected region had been successful. Field trials have begun to test the effect of reduced worm burdens in the control of BIRDVILLE DISEASE in horses.

An extensive outbreak of MASTITIS IN SHEEP indicated that the condition might become a serious economic problem. An organism was isolated from cases and reproduced the disease when injected into the mammary gland of susceptible ewes. Studies on STERILITY IN RAMS in the hot summer months indicated some value from administration of thyroid extracts. Much sterility is due to EPIDIDYMITIS and in some cases metastatic CASEOUS LYMPHADENITIS abscesses were found in the epididymes.

Treatment of SARCOPTIC MANGE in pigs with 0.1% gamma isomer of benzene hexachloride was satisfactory. NITRATE POISONING in pigs was traced to nitrate in water used for boiling the food. It is believed that certain elements in the metal of the containers act as catalysts in reducing nitrates.

In a case of CYANIDE POISONING the drug was detected in the feed but not in stomach contents.

A feeding trial with seeds of *Datura stramonium* failed to support the suspicion that they may have been responsible for sickness seen in pigs fed milo grain contaminated with the seeds.

In some outbreaks of SPIROCHAETOSIS in fowls the usual vectors, *Argas persicus* and *Dermanyssus gallinae*, either had not been found or had been present in very small numbers. On one farm *Culex fatigans* was suspected as a possible vector. Trials had been held which demonstrated the value of sodium salts of sulphamerazine and sulphamethazine in drinking water to control COCCIDIA.

DIOSIS in chickens. The latter drug appeared to be distasteful to the birds.

Cases of PEROSIS occurred in heavy breeds when 4-9 weeks old. Manganese sulphate in the diet at 50 parts per million prevented the condition.

A nervous disorder spoken of as "CRAZY CHICK" was described as follows: "Staggering gait, the chickens walking or running with a lean to one side as if deprived of their power of balance. They could maintain balance by leaning on troughs, etc., and walk to the end and then topple over on their sides. They then lay on their backs and kicked with their legs in the air. They were later paralysed and lay on one side".

Other matters associated with animal health and production given brief mention include GLASSER'S DISEASE of pigs, CALF PNEUMONIA, ICTERO-HAEMOGLOBINURIA in calves, BRUCELLOSIS, HELMINTHIASIS of cattle and sheep, GEORGINA RIVER DISEASE of cattle and sheep, SHEEP BLOW-FLY, sheep husbandry, climatological survey to investigate the occurrence of drought, COPPER DEFICIENCY, FLUOROSIS in sheep (it is suspected that "HUMPY BACK" or KYPHOSIS may be a chronic fluorosis).

There are considerable statistical data on stock numbers and production.—H. McL. G.

CANADA. (1948.) Report of the Veterinary Director General for the year ended March 31, 1948. [CHILDS, T.] pp. 49. Ottawa: E. Cloutier. 2017

Progress in eradication of TUBERCULOSIS and BRUCELLOSIS is hampered by shortage of staff but approximately half the cattle in Canada are under supervision. Tables give the numbers of cattle tested, numbers of reactors and compensation paid. GLANDERS, DOURINE and SHEEP SCAB have been eradicated; ANTHRAX, MANGE in horses and cattle, and SCRAPIE are rare diseases. FOOT AND MOUTH DISEASE is now firmly established in Mexico, and fears are expressed that the disease may spread to Canada. No cases of SWINE FEVER occurred during the year 1947-48. FOWL PLAGUE has not yet appeared in Canada, but an outbreak of NEWCASTLE DISEASE occurred in Ontario during February and March, 1948.

—G. B. S. HEATH.

U.S.A. (1945.) Report of the Administrator of Agricultural Research, 1945. p. 238. Washington, D.C.: U.S. Govt. Printing Off. Items of veterinary interest pp. 70-98. 2018

In clinical trials with BOVINE MASTITIS penicillin treatment did not cure all quarters proved by the laboratory to be infected with penicillin sensitive organisms. The non-irritant nature of penicillin makes it superior to other drugs. It is not, however, capable of dealing with

all cases of the disease and requires every possible aid from the application of hygienic and administrative measures of control.

Effects of temperature on the ANTHRAX bacillus and spores was studied. The vegetative form of *B. anthracis* in unopened g. pig carcasses is destroyed by anaerobic organisms in 72-80 hours in temperatures of 28°-30°C. or higher temperatures. At ice-box temperatures (5°-10°) the bacillus dies off slowly, being recoverable up to four weeks after death. If carcasses are opened before decomposition has set in at room temperature the vegetative forms will sporulate and persist in the tissues for weeks.

Of 206 intestinal tracts of "non-visible lesions tuberculin reactors" examined for *Mycobacterium Johnei* 17% of 52 specimens from the N.E. States, 28% of 43 specimens from Southern States and 10% of 111 specimens from the middle west were positive.

Tuberculin testing was continued. From official statistics for the period 1936-45 there has been a persistent decline of BOVINE TUBERCULOSIS. There were 165,496 reactors representing 0.7% of the cattle tested in 1936. By 1940 there were 40,702 reactors 0.3% and since 1942 when there were 28,008 reactors the numbers of reactors have been well under 20,000, representing 0.18%-0.24% of the cattle tested.

At the end of the year 64,790,921 cattle were in herds under supervision for the eradication of the disease.

Of 3,896 cattle tested for JOHNE'S DISEASE with johnin or avian tuberculin 6.2% reacted. No indemnity was paid for reactors.

War-time difficulties hampered BRUCELLOSIS eradication work. There had been an increase of the infection in the past two years. Tests yielded 243,050 reactors, 4.7% of the total tests. This included 86,738 reactors in calfhood-vaccinated herds for which Federal indemnity was not paid. Vaccination with strain 19 has been found of value in cattle over eight months of age as well as in calves.

FOWL TYPHOID control is complicated because *Salmonella gallinarum*, and *S. pullorum* cross agglutinate with blood or serum of either infection and also by typhoid infected birds which recover, acting as carriers of the disease.

SWINE ERYSIPELAS was more prevalent in the Corn Belt according to the reports of field veterinarians. The experimental use of the serum-culture method of immunization was applied by co-operating veterinarians to 1,438,113 pigs with highly satisfactory results.

SWINE ERYSIPELAS control is by simultaneous vaccination with live culture vaccine and hyper-immune serum. 1,438,113 pigs were vaccinated

with satisfactory results. SWINE ERYSIPELAS infection was diagnosed in chickens. The condition was complicated by coccidial infection.

In a study of BOVINE BRUCELLOSIS it was found that post-vaccinal blood reactions were modified by prevaccinal exposure during calfhood. It was found that 100% of vaccinated heifers born of infected dams gave negative reactions four months after vaccination, while 61% of heifers from healthy dams gave average titres of 1:200. Tests of the intra-dermic method of vaccination with Strain 19 have not yet reached the stage when the method can be applied instead of the tried subcutaneous method. Three million doses of *Brucella* vaccine Strain 19 were produced. All *Brucella* antigen used was produced by the Bureau of Animal Industry.

Both boars and sows could act as carriers of the *Br. suis* infection.

The only centre of DOURINE infection in horses is in Arizona in a few districts of the Pagago Indian Reservation.

Sarcocystis, parasites that occur in the muscles of domestic animals and hitherto regarded as protozoa have been proved to be fungi. The crescent-shaped parasites, hundreds of which are present in a single sarcocyst, were obtained from pigs and cultured on suitable media. They developed into yeast-like bodies and ultimately a mycelium with dark coloured sporangia. When such cultures were injected or fed to pigs, most of them became infected with sarcocysts.

Sulphamerazine and sulphamethazine fed 1 lb. of the drug to 99 lb. of food to poultry to prevent COCCIDIOSIS (*Eimeria tenella*) was only of value if fed within 72 hours of experimental infection of the birds. If the medicated mash was fed within 48 hours of infection a definite protection was given.

Special emphasis was placed on differentiation of VESICULAR DISEASES to avoid any failure to recognize FOOT AND MOUTH DISEASE. A sound-film has been prepared illustrating the clinical symptoms of the three vesicular diseases: FOOT AND MOUTH DISEASE, VESICULAR STOMATITIS and VESICULAR EXANTHEMA in cattle, pigs, horses and g. pigs. The film describes the laboratory methods of distinguishing these diseases.

There were 19,590 cases of INFECTIOUS EQUINE ENCEPHALOMYELITIS in 33 stables and approximately 24.4% deaths; 82% of the outbreaks were in August, September and October; 90% of all cases were in the West North Central and West South Central States. In vaccinated animals the incidence of the disease was only 0.2 per thousand and in unvaccinated animals 2.9 per thousand. It is most important to determine the type of virus in an outbreak.

EQUINE INFECTIOUS ANAEMIA.—From further experimental evidence it was demonstrated that the blood of a symptomless carrier was still infective after nearly ten years. The virus in whole blood dehydrated under high vacuum, while frozen ("lyophilization") was still virulent after 32 months' storage in vacuum sealed ampoules at room temperature in the light. Virus in filtered serum collected from an acute case and held for 42 months in the refrigerator at 5°-10°C. was no longer virulent. Red blood corpuscles from citrated blood of an acute case was still virulent and capable of causing disease in normal horses when injected subcutaneously after being washed in normal saline six times, laked with distilled water and then rapidly frozen and thawed six times consecutively. The injection of antigens prepared from acetone-precipitated serum globulins from virulent blood is not a reliable means of diagnosis. Complement-fixation tests are also not reliable. Penicillin in treatment has no beneficial effect.

Crystal violet vaccine was used experimentally under average farm conditions. The results indicate that the vaccine gives adequate protection against SWINE FEVER in selected herds; 3,348 outbreaks of the disease were reported.

In tests 98% of the crystal violet-glycerol vaccinated pigs were adequately protected against SWINE FEVER as against 88% of the control crystal violet phosphate vaccinated pigs.

Determination of minimum lethal doses of blood at various stages of infection by the virus of SWINE FEVER was studied. The maximum amount of virus was generally present in the blood on the sixth to the eighth day of infection when it was equivalent to one million m.l.d. per ml. In one pig doses of 1:2,500,000 ml., however, produced infection using blood taken on the seventh day of infection, but on the ninth day blood from the same pig was not virulent.

D.D.T. destroyed lice on pigs in three hours when in 0.1% suspension, but the eggs hatched out later. A 0.75% suspension was necessary to destroy both the lice and the eggs and was successful in a large herd under farm conditions up to 60 days after treatment.

To control WARBLER (*Hypoderma* spp.) 2,225 animals were treated with a standard medicated wash rubbed in with a stiff brush. This wash consisted of 12 oz. of cube powder (4.4%-5% rotenone content) and 3 oz. of soap per gal. of water. Grubs were extracted 6-10 days after the wash treatment. In 10% of the cattle 98% of the grubs were dead. In a further extraction of grubs 34-41 days after treatment 97% were dead. Seven weeks later all grubs were extracted and less than 5% were alive.

Sheep keds in small flocks were destroyed by a 0.1% suspension, but this was not so successful when used for dipping with large flocks. It is suggested that much of the D.D.T. is strained out by the fleeces of the first part of the flock dipped.

Inspection of animals imported included 422,867 cattle, 235,621 sheep and 20,651 equine species. Animals examined for export totalled 86,206.

The enforcement of transportation and quarantine laws in the control of animal diseases includes veterinary inspection, immunization of pigs against SWINE FEVER and dipping for SCABIES and TICK INFESTATION. Particular attention was given to the examination of cattle and pigs for FOOT AND MOUTH DISEASE. No cases were diagnosed.

Eighty-four veterinarians and other Bureau employees were working with State and Territorial employees on tick eradication. 7,796,815 inspections or dippings of cattle and 524,664 of equines were made. On Porto Rico island the tropical variety of tick (*Boophilus annulatus* var. *australis*) is prevalent. It was necessary to treat sheep and goats on infected premises. 387,727 inspections and dippings were made.

TICK INFESTATION introduced from Mexico was a menace which would continue until some artificial barrier was provided.

There were 23,093 cattle in SCABIES infected herds.

SHEEP SCAB is largely confined to the Mid-West. The greatest number of infected animals were in Louisiana.

STRONGYLOSIS IN HORSES was being controlled by feeding a 1:40 mixture of phenothiazine in the salt mixture supplied.

In cattle an average intake of 22 g. of a 5% phenothiazine mineral mixture was found necessary to control parasitic infections of the alimentary tract. While cattle were being fed timothy hay this amount was found to be adequate to control parasites, but this was not so while they were fed alfalfa.

Hexachlorethane - bentonite suspension in doses of 30 ml. was effective in removing LIVER FLUKES from sheep. One hundred and four of 110 sheep treated were free from liver fluke eggs 10-16 days after treatment. The liver fluke drench used consists of hexachlorethane 1 lb., one and a half oz. bentonite (a finely powdered clay), one-quarter teaspoonful of white flour and 25 fl. oz. of water mixed in a pail and stirred with a wooden paddle.

"After giving time for the ingredients to soak" the contents of the pail are passed twice through a 20-mesh screen. A nail brush is used to brush the more solid ingredients through the mesh. The total quantity of the above suspension is about one quart.

In experimental work on HOOKWORM IN LAMBS it was found that naturally acquired heavy infestation in flocks was more damaging than artificially induced heavy infestations. The feeding of an adequate diet appears to be the main cause of the difference. Those lambs fed an adequate diet become anaemic when heavily parasitized, but they survive the damage caused.

In FILARIASIS IN SHEEP caused by *Elaeophora schneideri*, the adults are localized in the arteries and the larvae in the skin of the head, face and occasionally in that of the abdomen and hind feet. Injections of tartar emetic in doses of 0.3 g. given intravenously at intervals of eight weeks in 30 ml. of a 6% solution of glucose was equally successful with the same treatment given twice a week for four weeks. Success was also attained using sodium antimonyl tartrate with trypan blue at weekly intervals for five weeks and lithium antimony thiomalate for another five weeks.

Goat infestations with STOMACH WORMS, HOOKWORMS and NODULAR WORMS were controlled experimentally by the use of a salt lick containing phenothiazine. Better results were obtained when the medicated lick was supplied continuously.

Feeding whey as a supplement has been found experimentally to prevent pigs becoming infected with large ROUNDWORMS, NODULAR WORMS and WHIPWORMS. It does not prevent *Strongyloides* infection. Treatment of pigs for large roundworms with sodium fluoride 1% in the feed gave good practical results against large roundworms 67%-100%, stomach worms 76%-100%; action against nodular worms and whipworms was insignificant. There was a small percentage of deaths following treatment, but there appeared to be no lesions attributable to the drug.

Two types of hormone, oestrogenic (produced by the ovaries) consisting of oestradiol dipropionate and a synthetic product diethylstilboestrol and gonadotropic (pituitary extracts and similar extracts acting on the ovaries) consisting of sheep anterior pituitary extract and pregnant mares' serum, were used to treat STERILITY IN CATTLE. Pregnancy resulted in approximately 60% of cows treated.—J. A. GRIFFITHS.

BOOK REVIEWS

OTERO, P. M. [M.D., Professor Bacteriology and Immunology, School of Tropical Medicine of

the University of Puerto Rico, San Juan, Puerto Rico]. (1948.) *Studies of brucella infection*

in Puerto Rico. pp. 173. Puerto Rico: The Author. 2019

This book is of special interest in as much as it describes the spread of the disease over a period of some 25 years following its introduction into the island of Puerto Rico in 1923 by cattle from the U.S.A. imported into dairies supplying milk to the capital city of San Juan. In the early years the disease was explosive in character and was largely confined to the environs of San Juan; to-day it occurs in all parts of the island, but abortions are more sporadic in occurrence.

In 1930 the incidence was very high in cattle but low in man and with the object of getting more precise knowledge of the method of transmission of the disease in man the author made a number of experiments on 40 human volunteers, ten of whom contracted infection. Six of these were infected through the abraded skin and four by ingestion. *Br. suis* and *Br. melitensis* were more pathogenic for man than *Br. abortus*. Infection was much more readily produced through the abraded skin than by ingestion. Vaccination of cattle with living virulent cultures reduced the number of abortions, but is considered to have been an important factor in spreading infection. Calfhood vaccination with strain 19 is now being used, but the author seems to have some reservations in his mind regarding this procedure. He considers that careful judgment is necessary in making additions to herds in which calfhood vaccination is being done since, in his experience, the addition of non-vaccinated cattle will not only produce abortions in the new unvaccinated animals but will also cause a flare-up of the disease in the vaccinated. He stresses that a great reduction in abortions in a vaccinated herd must not be considered to indicate eradication of infection.

The book is well printed and produced and will interest both veterinarians and medical men.

—M. C.

SMART, J. [M.A., D.Sc., Department of Zoology, University of Cambridge (Formerly Assistant Keeper in the Department of Entomology)]. (1948.) **A handbook for the identification of insects of medical importance.** pp. xi + 295. London: British Museum (Natural History). 2nd edit. 20s. 2020

This new edition of Smart's book retains all the good features of the first edition, while its value has been enhanced by what has been added. The sections on fleas and on tsetse flies have been considerably altered. New information is included on the malaria-carrying mosquitoes. The section on arachnids which was very brief in the original edition has now been revised by Dr. K. Mellanby and its usefulness improved.

The book can be wholeheartedly recom-

mended for use by the veterinary worker. Too much praise cannot be given to the large and clear drawings which are a considerable aid to accurate identification. A very adequate appendix is given which summarizes information on catching apparatus and the various methods of preserving insects and other arthropods.—J. B. CRAGG.

MINER, R. W., GORDON, M., & SALIN, L. [Editors]. (1948.) **The biology of melanomas.** pp. xii + 466. New York: The New York Academy of Sciences. Vol. IV. 2021

This book, the subject matter of which is much wider in scope than the title might suggest, represents the collected and illustrated papers given at a conference on the "biology of normal and atypical pigment cell growth" which was held by the Section of Biology of the New York Academy of Sciences in November, 1946.

The range of matters dealt with is as follows:—the development and clinical study of pigment cells; cytological and genetic aspects; endocrinological and physiological studies and their chemical and physical aspects of the problem, a wide range of work being covered.

Much new information is presented and many details which were previously only known to specialists in their respective fields were made available to all workers, revealing however the complexity of the field, but bringing into prominence the biology of the melanin-containing cells.

Studies of special veterinary interest perhaps are:—cases of melanosis in a turkey and a calf, and of melanomata in a fowl and a pig, as well as two human cases, described as suggesting the possibility that some melanin-secreting cells are mesodermal and not ectodermal, in origin. Tissue culture studies of pigmented melanomas. The cytology of the typical and the amelanotic melanoma. Morphological colour changes in vertebrates. Some features of melanoid biochemistry in animals. Hormonal regulation of feather pigmentation in the fowl. Some biochemical aspects of pigmented cells: a mechanism is suggested which accounts for the association of melanin with pseudoglobins, the presence of enzyme systems, the uniformity in size and shape of the pigment granules, and the fact that pigment granule synthesis is restricted to relatively few cells.—E. COTCHIN.

GUNN, J. A. [C.B.E., M.A., M.D., D.Sc., F.R.C.P., Emeritus Professor of Pharmacology & Therapeutics, University of Oxford]. (1948.) **An introduction to pharmacology and therapeutics.** pp. ix + 301. London: Geoffrey Cumberlege. 8th Edit. 8s. 6d. 2022

The eighth edition of this well known book, first published in 1929, has been produced in view

of the changes since the seventh edition in 1944 and the effects of the revision of the U.S. Pharmacopoeia (1947) and the British Pharmacopoeia (1948). New sections have been added—chemotherapy, penicillin, sex hormones, blood coagulants—and the remainder of the 26 chapters have been revised or rewritten. With the inclusion of vitamins and vaccines and antitoxins, the book covers the whole background of *materia medica*.

The book was originally written for pre-reading on the subject by medical students. However, as is usual with books of an introductory kind, it would also serve wider interests and veterinary and physiological students and also biochemists and bacteriologists should find, or continue to find, this new edition of value. It is a pity that such a useful book could not have been given a clearer typography and better paper.

—MALCOLM WOODBINE.

NICOLAS, E., & BRION, A. (1949.) *Vade-mecum du vétérinaire. [The veterinarian's vade-mecum.]* pp. xx + 763. Paris: Vigot Frères. 8th Edit. 2023

The title was well chosen, for the 763 pages are full of useful information; yet despite this the authors have succeeded in retaining the original form of a pocket edition, now the eighth to be brought out.

In the main the volume is a treatise on pharmacology, as the greater part is devoted to a description of the various drugs used in veterinary medicine. These are given in alphabetical order, each drug being described along with its common preparations, their uses, indications for and against their employment and the dosage. Instructions are included on prescription writing, the duties of veterinary surgeons regarding the dispensing and utilization of drugs, methods of administration of medicaments—in their widest sense—to animals, classification of drugs and their reactions in the various animals for which they may be used.

The principles underlying the use of vaccines and sera are excellently described and details are included of each disease, contagious or otherwise, which can be dealt with by means of biological products. The authors also indicate the recognized methods of treatment for the common ailments and conditions met with in veterinary practice, concisely tabulated in alphabetical order. But, what will perhaps appeal most to the reader is the careful way in which cross references are made so that a busy practitioner can with the least possible delay pick out the information he desires on practically any subject.

Amongst other subject matter contained are extracts from the French legislation regarding animal diseases, animal husbandry and general

hygienic methods of stock management and feeding, signs of health and symptoms of disease, methods of euthanasia and instructions as to the dispatch of specimens to the laboratory. There is a summary of contents in serial order at the beginning of the volume and an alphabetical index at the end.

The whole book is clearly and well printed and will be most helpful to any veterinarian, whatever his nationality.—D. S. RABAGLIATI.

BOTOLFSEN, E., & MOLLAND, J. (1947.) *Kjemi for medisinerere, odontologer og veterinærer. [Chemistry for doctors, dentists and veterinarians.]* pp. 552. Oslo: Johan Grundt Tanum. 2024

This is a very comprehensive text-book of chemistry for the curricula of medical, dental and veterinary students and perusal emphasizes the extent to which this basic science has to be covered nowadays. The subject certainly has been handled with great thoroughness and any student learning all that is presented would certainly be extremely well grounded for further work in biochemistry or pharmacology.

There are sections on inorganic, organic, physical and analytical chemistry, all four being extensive. The material is presented with care so as to be followed easily by those starting with a not very advanced knowledge of the subject and the compounds selected as examples of the themes are, of course, germane to physiology and medicine.

From the viewpoint of the veterinarian with an interest in chemistry the aim of the authors has been well achieved.—J. E.

KOCH, F. C. [Frank P. Hixon Distinguished Service Professor Emeritus of Biochemistry, University of Chicago] & HANKE, M. E. [Associate Professor of Biochemistry, University of Chicago]. (1948.) *Practical methods in biochemistry.* pp. xii + 420. Baltimore: The Williams & Wilkins Co.; London: Bailliere Tindall & Cox. 5th Edit. 16s. 6d. 2025

This manual of practical pathological chemistry is intended to accompany a theoretical text-book. The design of the book is conventional, being divided into three parts dealing with the chemistry of cell constituents, of the digestive tract and of the blood and urine. Emphasis is placed upon the conduct, in a semi-quantitative manner, of the qualitative examination of biological material, and experimental procedures, with notes on underlying theory, are given in some detail. Hydrogen-ion activity and pH are discussed in the light of modern ionic theory, an excellent description being given of the experimental determination of pH and of the errors involved in different methods of measurement.

The chapter on proteins includes detailed descriptions of the modern methods for quantitative determination of individual amino acids.

The major portion of the book deals with the chemistry of the blood and urine, including the use of the Van Slyke manometric apparatus for blood gas analysis. The principles underlying each analysis are briefly described and the steps taken to enhance specificity of reactions are explained. The empirical nature of many biochemical analyses requires rigid adherence to technique and the authors have admirably succeeded in avoiding descriptive tedium by concise inclusion of their own practical experience of the methods described. The chapter on colorimetric and fluorometric methods for the determination of vitamins should prove useful not only to the student but to many others. The introduction of the use of microbiological methods in the determination of amino acids and vitamins is timely in a rapidly expanding and changing field.

There is an appendix of more than 50 pages containing many practical hints and adequate details for the preparation of most common biochemical reagents. The print is pleasant to read and typographical errors are few. Occasionally phrasing is clumsy, but this in no way detracts from the accuracy or usefulness of the book.

—A. B. PATERSON.

LONG, P. H. [M.D., F.R.C.P., Professor of Preventive Medicine, The Johns Hopkins University School of Medicine]. (1948.) **A-B-C's of sulfonamide and antibiotic therapy.** pp. x + 231. Philadelphia & London: W. B. Saunders Co. 17s. 6d. 2026

The author states that the book, which is a handy size and well printed on good paper, is designed for medical and surgical practitioners and represents the essence of 13 years' experience.

The book gives concise details on the use of sulphonamides and of proved antibiotics in treating infectious processes and deals with the dosage forms, clinical pharmacology, toxic signs and hints on their use. The main part of the book—180 pp.—is concerned with the clinical application of the drugs and is very well arranged in alphabetical order and, for a first edition, errors are conspicuous by their absence.

The book is primarily for medical people, but others interested in the field may find it of some use, although no references are cited in the book. Busy veterinary practitioners may find the book of practical value as a guide to doses and applications of the drugs.—MALCOLM WOODBINE.

WALTER, C. W. [A.B., M.D., Assistant Professor of Surgery, Harvard University]. (1948.) **The aseptic treatment of wounds.** pp. ix + 372.

New York: The Macmillan Company. 2027

This is one of the most important contributions to the surgical literature in recent years, and while intended primarily to be a text-book for medical students and for surgeons, will interest also veterinary surgeons, hospital administrators, engineers, and surgical manufacturers. The technique described is that elaborated at the Peter Bent Brigham Hospital, Boston, and the book is a testimony to the surgical philosophy of Harvey Cushing and of Elliott C. Cutler, who has written a foreword. A tremendous amount of labour must have gone into the collecting of data and the preparation of the material for publication. Throughout there is a pleasant medico-historical undercurrent, and there are attractive introductory quotations at the beginning of each chapter. Some of the chapter-headings will indicate the scope of the work: chemical disinfection of instruments; chemical and physical destruction of bacteria; sterilization by steam and by dry heat; disinfection of the skin; operating room technique; preparation of parenteral fluids; blood and plasma facilities; hospital infection of wounds; control of communicable diseases; maintenance of sterilizing equipment. The term "sanitization" [chapter 6] will be unfamiliar to British readers. The clear and helpful illustrations by Mildred B. Coddington greatly enhance the value of the text, and there is a six-page index and a host of useful, carefully compiled references.

—W. R. BETT.

MEIßNER, H., & SCHOOP, G. (1948.) **Tierseuchen und ihre Bekämpfung. [Control of animal epidemics.]** pp. 366. Hannover: M. & H. Schaper. 7th Edit. DM. 24.— 2028

This book is actually the seventh edition, not of a book of the above title, but of one named "Kriegstierseuchen", which first appeared at the outbreak of the second world war. In course of the various editions the contents have increased from diseases of special importance in wartime, to a comprehensive account of infectious and endoparasitic diseases of domestic animals.

It is interesting to note that the authors use German classification and nomenclature of the anaerobic and paratyphoid infections. A reader must, therefore, be very careful when using these chapters.

The numerous figures cannot escape criticism: the necessary clarity has often been lost as a result of printing on the poor quality paper used, and in addition many attempts to illustrate animals allegedly affected with infectious or parasitic disease fail to convey helpful information. The text is sound, but out of date here and there.

The book is interesting as a mirror of current German teaching.—J. E.

ABDERHALDEN, E., & MOURIQUAND, G. (1948.) *Vitamine Und Vitamintherepae. [Vitamins and vitamin therapy.]* pp. viii + 408. Bern: Medizinischer Verlag Hans Huber. S.Fr. 28.— 2029

This handbook is the first of a series primarily designed to collect special information in a form which will make it readily available to the doctor in general practice. The general editor of the series, Prof. Gordonoff, explains in an introductory note that an attempt has been made to bring together in one volume an account of the various views on many subjects and to present the most up-to-date research in a simple form.

A. contributes a section on the experimental study of vitamins and gives a comprehensive account of general methods of research and of the nature of vitamins. This is followed by detailed sections on the water-soluble vitamins, including some of the less well defined factors which have recently been described. In each section the effects of deficiency of the vitamin and its physiological function in the animal organism are discussed, with a short account of the chemical nature of the factor and its relation to other vitamins. The fat-soluble vitamins are then dealt with in the same manner. A short chapter on essential amino-acids concludes the experimental part, which has an appendix of simple tables of vitamin contents of common foods and of human and animal organs and a note of the daily requirement of man for the various vitamins.

M. contributes the clinical section with an account of vitamin deficiency and vitamin therapy in specific and non-specific conditions. Some observations on deficiency symptoms in animals are included, but they do not overlap to any extent the information in the experimental sections.

A list of references is given for each chapter in the experimental part which is intended to cover the clinical sections as well since no references are included in the second part of the book. A brief index provides a key to the matter discussed.

Although this book is designed for the medical practitioner, it cannot fail to interest the veterinary worker in the field and the research laboratory with its useful collection of valuable knowledge.—A. M. COPPING.

OPPERMANN, T. (1947.) *Über Blutreserven der Haustiere insbesondere der Pferde. [Blood reserves of domestic animals, especially of horses.]* pp. 28. Hannover: M. & H. Schaper. DM. 2.20. 2030

This small pamphlet containing six illustrations stresses the importance of blood-picture examination for ascertaining the blood reserves

and the significance of high reserves for endurance and productive power of animals.

Examining the blood-picture of horses immediately after work the author found that the percentage of haemoglobin and erythrocytes was higher than after a period of rest. The amount of reserve blood generally stored in the spleen varies with the individual and is a desirable factor not only in thoroughbred and work horses, but also in horses used for the production of serum in laboratories.

A comprehensive and brief outline intended for the veterinary practitioner and breeder.—E. G.

SCHÖNBORN, G. (1947.) *Die Fleischbeschau. [Meat inspection.]* pp. 289. Hannover: M. & H. Schaper. DM. 14.— 2031

In the preface the author emphasizes the development of meat inspection into one of the most important branches of food hygiene in Germany during the last 50 years. In charge of this service is the veterinary surgeon aided by the lay meat inspector. Although the responsibility of the latter is limited to healthy slaughtered animals, his work covers a wide field and the author has written this book for these lay inspectors in Germany, including the inspectors for trichinosis.

It is divided into four chapters: (1) General survey, (2) Basic knowledge of meat inspection, (3) Technical means of meat inspection, and (4) Legislation.

The text is comprehensive and gives the reader a clear picture.

Whilst the description of the lymphatic system and the paragraphs dealing with infectious diseases and appearances of health in slaughtered animals convey to the future lay inspector all the data he requires, the paragraphs dealing with anatomy and physiology do not compare so favourably.—A. GINSBERG.

HAUSAM, W. (1948.) *Die Kennzeichnung des Schlachtviehs. [Marking of animals intended for slaughter.]* pp. 56. Stuttgart: Wissenschaftliche Verlagsgesellschaft M.B.H. DM. 2.80. 2032

The author, a specialist in Germany's leather research, discusses the eventual damage to hides and wool caused by the marking of animals intended for slaughter and suggests a remedy which would prevent serious losses.

Several thousand experimental markings carried out with different dyes have proved that the only reliable method is the use of red, blue, yellow, and green "enamel paints". These, combined with soft resins, produce a dye which adheres and lasts well, is easily removed and is harmless to the skin and wool.

In 1944 these dyes were officially introduced in Germany as the recognized method of marking animals intended for slaughter, but later suspended because of supply difficulties and economic conditions.—A. GINSBERG.

POTTER, V. R. [Edited by]. (1948.) **Methods in medical research.** Vol. I. pp. xiii + 372. Chicago: The Year Book Publishers, Inc. \$ 8.00. 2033

This is the first of a new series, the object of which is to provide some adequate medium for the publication of methods and techniques in medical research. The need for such a series of publications arises since it is not usually easy to find an appraisal of methods; it is becoming difficult to obtain publication of papers dealing solely with technique; methods are constantly being improved or modified; and many methods

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BOOKS RECENTLY RECEIVED

[Notice of recently received books in this list does not preclude review.]

BROCQ-ROUSSEU, D., & ROUSSEL, G. (1949.) **Le sérum normal. Propriétés diastatiques du sérum et des différents éléments du sang.** [The normal serum. Diastatic properties of serum and the different elements of blood.] pp. 377. Paris: Vigot Frères. 3rd edit.

DÉVÉ, F. (1948.) **L'échinococcose osseuse.** [Echinococcus infection of bones.] pp. 236. Montevideo: A. Monteverde & Co. Fr. 700 (14s. 6d.)

DUNCAN, A. C. (Revised by). (1949.) **Thompson's elementary veterinary science for agricultural students, farmers and stockkeepers.** pp. viii + 474. London: Baillière, Tindall & Cox. 6th edit. 15s.

EMMENS, C. W. (1948.) **Principles of biological assay.** pp. 206. London: Chapman & Hall. 21s.

FRAUCHIGER, E., & FANKHAUSER, R. (1949.) **Die Nervenkrankheiten unserer Hunde.** [Nervous diseases of dogs.] pp. 184. Bern: Hans Huber. Sw. fr. 16.80.

GADE, W. (1948.) **Beginnelsen der organisch-chemische nomenclatuur.** [The principles of nomenclature in organic chemistry.] pp. xii + 224. New York, Amsterdam, London, Brussels: Elsevier Publishing Co. Inc. (London Distributors: Cleaver-Hume Press.) 12s.

GRIGNANI, A. (1948.) **Prontuario terapeutico ad uso del veterinario practico.** [Therapeutic handbook for veterinary practitioners.] pp.

362. Milan: Istituto Sieroterapico Milanese S. Belfanti. L. 800.

HEPLER, O. E. (1949.) **Manual of clinical laboratory methods.** pp. xv + 387. Springfield, Ill.: C. C. Thomas. Oxford: Blackwell Scientific Publications. 4th edit. 45s.

HEWITT, L. F. (1948.) **Oxidation-reduction potentials in bacteriology and biochemistry.** pp. 130. London: London County Council. 5th edit. 4s. 6d. (By post 4s. 10d.)

MOON, G. R. (1949.) **How to become a doctor. A complete guide to the study of medicine, dentistry, pharmacy, veterinarian medicine, occupational therapy, chiropody and foot surgery, optometry, hospital administration, medical illustration, and the sciences.** pp. 181. Philadelphia, Toronto: The Blakiston Co. \$2.00.

MORGAN, B. B., & HAWKINS, P. A. (1949.) **Veterinary helminthology.** pp. ix + 400. Minneapolis, Minn.: Burgess Publishing Company. \$7.00.

SOUTTAR, H. S. (1948.) **Physics and the surgeon.** pp. xii + 60. Oxford: Blackwell Scientific Publications, Ltd. 7s. 6d.

TAGAND, R., & BARONE, R. (1949.) **Abrégé de névrologie du cheval.** [Concise neurology of the horse.] pp. 320. Lyon: Imprimerie des Beaux-Arts Camille Annequin.

INDEX VETERINARIUS

The publication of *Index Veterinarius* commenced with the indexing of the literature of 1933. It is a complete index of current publications relating to veterinary research, public health, administration, education and other aspects of veterinary science.

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TECHNICAL COMMUNICATIONS, ETC.

Commonwealth Bureau of Animal Health, Weybridge. Review Series No. 2. Modes of spread of <i>Streptococcus agalactiae</i> infection in dairy herds. A report on co-ordinated observations by the Agricultural Research Council of the United Kingdom. May, 1944		3s. 0d.
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Commonwealth Bureau of Pastures and Field Crops, Aberystwyth.		
36.	The grasslands of Latin America. By Miss G. M. Roseveare. Late 1946 ...	20s. 0d.
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Commonwealth Bureau of Plant Breeding and Genetics, Cambridge. The new genetics in the Soviet Union. By P. S. Hudson and R. H. Richens. May, 1946		6s. 0d.
Commonwealth Bureau of Soil Science, Harpenden.		
43.	Land classification for land-use planning. June, 1946	4s. 0d.
Commonwealth Mycological Institute, Kew. An annotated bibliography of medical mycology, 1945. 1946		5s. 0d.

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